Vol. 1064 Number 4

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

March 25, 1986

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

U.S.
DEPARTMENT
OF COMMERCE

Patent
and
Trademark
Office

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

March 25, 1986 Volume 1064 Number 4

CONTENTS

	Page
Patent and Trademark Office Notices	
Patent Cooperation Treaty (PCT) Information	1064 OG 26
Notice of Maintenance Fees Payable	1064 OG 26
Patents Which Expired Due to Failure to Pay Maintenance Fees (Sept.—Dec. 1985)	1064 OG 26
Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees	1064 OG 27
Reissue Applications Filed	1064 OG 27
Requests for Reexaminations Filed	1064 OG 27
Recordation of Trade Name	1064 OG 27
Errata	1064 OG 27
Service by Publication	1064 OG 28
Accelerated Examination and Accelerated Appeal Procedure in the Japanese Patent Office	1064 OG 28
Introduction of an Accelerated Examination and Accelerated Appeal Examination System for Working-Related Patent (or Utility Model) Applications	1064 OG 28
PTO Status	1064 OG 37
Patent Certificates of Correction	1064 OG 39
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1064 OG 40
Condition of Patent Applications	1064 OG 41
Reissue Patents Granted (32,094)	1479
Plant Patents Granted (5,697)	1481
Patents Granted	
General and Mechanical (4,577,346)	1483
Chemical (4,578,084)	1741
Electrical (4,578,526)	1871
Design Patents Granted (283,076)	1975
Index of Patentees	PI 1
Indices of Reissue, Design and Plant Patentees	PI 53
Classification of	
Patents (Including Reissues)	PI 57
Designs and Plants	PI 60
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 61
Designs and Plants	PI 62
Change of Address Form and Subscription Order Form	Back Page

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office has been changed as of Feb. 9, 1986 and is announced in the *Official Gazette* at 1061 O.G. 30 on Dec. 31, 1985.

International PCT fees have been changed effective Jan. 1, 1986 and were announced in the *PCT Gazette* on Oct. 24, 1985 and in the *Official Gazette* at 1061 O.G. 30 on Dec. 31, 1985.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority	
—No corresponding prior U.S. national application filed	420.00
—Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
if paid before Feb. 9, 1986	750.00
if paid on or after Feb. 9, 1986	830.00
International fees	
Basic fee (first 30 pages):	
if paid before Jan. 1, 1986	280.00
if paid on or after Jan. 1, 1986	325.00
Basic Supplemental fee (for each page over 30):	
if paid before Jan. 1, 1986	6.00
if paid on or after Jan. 1, 1986	6.00
Designation fee for the first 10 national or regional offices:	
if paid before Jan. 1, 1986	70.00
if paid on or after Jan. 1, 1986	80.00
Designation fee for 11th and subsequent designations	No charge

DONALD J. QUIGG,
Dec. 17, 1985. *Assistant Secretary and Commissioner of Patents and Trademarks.*

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Mar. 22, 1983, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,377,007 through 4,377,871
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98–622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

PATENTS WHICH EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEES (SEPT. — DEC. 1985)

The following is a compilation of the NOTICE OF EXPIRATION OF PATENTS DUE TO FAILURE TO PAY MAINTENANCE FEES which have been

published in the Official Gazette from Dec. 17, 1985, through Mar. 18, 1986.

The patents have issue dates in the range of Sept. 29, 1981 through Dec. 29, 1981.

Patent Number	Serial Number	Issue Date
4,291,808	06/215,853	09/29/81
4,294,398	06/227,542	10/13/81
4,297,354	06/216,423	10/27/81
4,298,873	06/222,104	11/03/81
4,300,288	06/217,250	11/17/81
4,301,214	06/216,196	11/17/81
4,301,602	06/223,566	11/24/81
4,301,921	06/241,282	11/24/81
4,303,154	06/225,733	12/01/81
4,304,277	06/231,337	12/08/81
4,304,355	06/229,725	12/08/81
4,304,663	06/225,597	12/08/81
4,304,719	06/228,013	12/08/81
4,305,243	06/216,825	12/15/81
4,305,878	06/225,289	12/15/81
4,305,954	06/233,653	12/15/81
4,306,354	06/218,860	12/22/81
4,306,962	06/231,819	12/22/81
4,307,160	06/217,269	12/22/81
4,307,203	06/247,808	12/22/81
4,307,703	06/249,944	12/29/81
4,307,706	06/215,977	12/29/81
4,307,768	06/215,710	12/29/81
4,307,869	06/216,304	12/29/81
4,307,964	06/238,191	12/29/81
4,308,041	06/232,466	12/29/81

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, th e patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED JANUARY 5, 1986 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,309,265	06/225,443	1/05/82
4,309,355	06/229,411	1/05/82
4,309,356	06/235,280	1/05/82
4,309,367	06/230,891	1/05/82

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,557,767, Re. S.N. 822,475, Filed Jan. 27, 1986, Cl. 148/023, FUSIBLE POWDERED METAL PASTE, Jennie Shi-Lan Hwang, Owner of Record: *SCM, Inc., Cleveland, Ohio,* Attorney or Agent: Robert A. Sturges, et al., Ex. Gp.: 113

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

No Publications This Issue.

Department of the Treasury U.S. Customs Service (T.D. 86-11) Recordation of Trade Name: "SUPREME IMPORT EXPORT CO., INC."

Agency: U.S. Customs Service, Department of the Treasury

Action: Notice of Recordation

Summary: On Mar. 14, 1985, a notice of application for the recordation under section 42 of the Act of July 5, 1946, as amended (15 U.S.C. 1124), of the trade name "SUPREME IMPORT EXPORT CO., INC." was published in the Federal Register (50 FR 10341). The notice advised that before final action was taken on the application, consideration would be given to any relevant data, views, or arguments submitted in opposition to the recordation and received not later than May 31, 1985.

Supreme International Corporation commented in opposition to the recordation of the trade name citing concern that because "SUPREME IMPORT EXPORT CO., INC." is confusingly similar to Supreme International Corporation it might be restrained from participating in import transactions under their established name.

SUPREME IMPORT EXPORT CO., INC. has indicated that it has no objection to goods arriving in the United States for Supreme International Corporation. Therefore, goods bearing the name "Supreme International Corporation" shall not be seized or detained as confusingly similar to "SUPREME IMPORT EXPORT CO., INC."

Accordingly, as provided in section 133.14, Customs Regulations (19 CFR 133.14), the name "SUPREME IMPORT EXPORT CO., INC." is recorded as the trade name used by Supreme Import Export Co., Inc., a corporation organized under the laws of the State of New York, located at 900 Broadway, New York, N.Y. 10003. The trade name is used in connection with the following merchandise manufactured in Hong Kong, Korea, Japan, Taiwan and the Philippines; playing cards; cigarette lighters; cellophane tape; toothbrushes; padlocks; cassette tapes; pens; batteries; cameras and curling irons.

Effective Date: (Jan. 31, 1986)

For Further Information Contact: Harriet Lane, Entry, Licensing and Restricted Merchandise Branch, U.S. Customs Service, 1301 Constitution Ave., NW., Washington, D.C. 20229 (202-566-5765).

Jan. 24, 1986.

EDWARD T. ROSSE,
Acting Director, Entry Procedures and Penalties Division.

Errata

The following registration number was inadvertently listed as renewed in the "Trademark Registrations Renewed" section of the Trademark Official Gazette of Nov. 26, 1985:

788,892	TM 179	Nov. 26, 1985

Consequently, the above-identified registration has not been renewed.

Feb. 12, 1986.

PATRICIA M. DAVIS,
Administrator for Trademark Operations.

Errata

The Registrant of Registration No. 775,823 listed in the "Index of Registrants" Section of the Trademark Official Gazette of Dec. 25, 1984, at TMI 16, was incorrectly identified as "Schotte Glaswerke, Jenear Glaswerk Schott & Gen."

The Registrant's name as corrected is "Schott Glaswerke".

PATRICIA M. DAVIS,
Feb. 10, 1986. *Administrator for*
Trademark Operations.

Errata

Registration Number 787,366, listed in the "Trademark Registrations Renewed" Section of the Trademark Official Gazette of Dec. 17, 1985 was inadvertently renewed as to International Classes 1, 6, 7, 9 and 10. The registration certificate should have been renewed as to International Classes 1, 6, 7, 9, 12 and 17.

787,366	TMOG 130	Dec. 17, 1985

Consequently, Registration Number 787,366 is renewed for International Classes 1, 6, 7, 9, 12 and 17.

PATRICIA M. DAVIS,
Feb. 10, 1986. *Administrator for*
Trademark Operations.

Errata

The following registration numbers were inadvertently listed as cancelled in the "Trademark Registrations Canceled, Section 8" section of the Trademark Official Gazettes of:

1,108,367	TMOG 205	July 30, 1985
1,109,082	TMOG 202	Aug. 6, 1985
1,105,507	TMOG 216	July 2, 1985
1,115,141	TMOG 202	Nov. 12, 1985
1,110,972	TMOG 206	Sept. 3, 1985
1,083,335	TMOG 452	Apr. 9, 1985
1,116,457	TMOG 182	Nov. 26, 1985

Consequently, the above-identified registrations are still active.

PATRICIA M. DAVIS,
Feb. 10, 1986. *Administrator for,*
Trademark Operations.

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by registered mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

GRT Corp., Los Angeles, Calif., Reg. No. 1,130,736, for the mark "JANUS" and design, Canc. No. 14,725.

GRT Corp., Los Angeles, Calif., Reg. No. 1,144,819, for the mark "JANUS", Canc. No. 14,726.

Checkcard Systems, Inc., Little Rock, Ark., Reg. No. 833,096, for the mark "CHECK CARD", Canc. No. 14,810.

Robert J. Tanner, Hallandale, Fla., Reg. No. 1,153,883, for the mark "LEISURE TIMES", Canc. No. 15,033.

Westboro Shoe Manufacturing Co., Inc., Hazelwood, Mo., Reg. No. 567,119, for the mark "THE TAYLOR-MADE SHOE", Canc. No. 15,240.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

Accelerated Examination and Accelerated Appeal Procedure in the Japanese Patent Office

The United States Patent and Trademark Office has been informed of an accelerated examination and appeal procedure available in the Japanese Patent Office for worked inventions.

In view of the interest expressed by practitioners in this country and in order to facilitate their patenting in Japan, the full text of the notice received from the Japanese Patent Office is reproduced below.

DONALD J. QUIGG,
Feb. 24, 1986. *Assistant Secretary &*
Commissioner of
Patents and Trademarks.

Japanese Patent Office
Introduction of an Accelerated Examination and Accelerated Appeal Examination System for Working-Related Patent (or Utility Model) Applications

Note for Foreign Applicants

1. The Japanese Patent office has decided, after long consideration, to introduce, through the administrative operation of the Patent Law and the Utility Model Law, an accelerated examination and accelerated appeal examination system for working-related patent (or utility model) applications, pursuant to the following basic polices:

(1) A part of the examination capability shall be allocated for accelerated examination and Accelerated appeal examination.

(2) The accelerated examination and accelerated appeal examination system shall initially begin on a test basis. The requirements and applications to which the accelerated examination and appeal examination are applied shall be reviewed, if necessary, taking into consideration the situation following the initial test period.

(3) Applicants shall be requested to submit the documents necessary for accelerated examination and accelerated appeal examination, such as the prior art search report and the comparison with prior art, that justify the accelerated procedure.

(4) Applicants shall be requested strictly to select requests for accelerated examination or accelerated appeal examination in order to attain fully the purpose of that system.

2. The acceptance of receipt by the Japanese Patent Office of the Explanation of Circumstances Concerning Accelerated Examination or Accelerated Appeal Examination for working-related patent (or utility model) applications shall commence on February 1, 1986.

3. The present text introduces the information that should be fully understood by foreign applicants who wish to make use of the above-mentioned system. Reference is made to the related Section of the Japanese Patent (or Utility Model) Law (Section 8):

(Patent administrator for residents abroad)

8. — (1) A person who has neither his domicile nor residence (nor, in the case of a legal entity, its establishment) in Japan (hereinafter referred to as "resident abroad") may not, except where a request for registration under subsection (3) is filed or as otherwise prescribed by Cabinet Order, proceed before the Office or institute a suit against any measure taken by an administrative agency in accordance with this Law or an order or ordinance thereunder, except through his representative with respect to his patent who has his domicile or residence in Japan (hereinafter referred to as "patent administrator").

(2) The patent administrator shall, in addition to the powers specially conferred on him, represent the principal in all procedures and in a suit instituted against measures taken by an administrative agency in accordance with this Law or an order or ordinance thereunder.

(3) Where a resident abroad is a patentee or has a registered right relating to a patent, the appointment or change of his patent administrator, the power of attorney or the extinguishment thereof shall not be effective against any third person unless it is registered.

4. Foreign applicants who submit the "Explanation of Circumstances Concerning Accelerated Examination or Accelerated Appeal Examination" for working-related patent (or utility model) applications shall proceed before the Japanese Patent Office in writing, in Japanese, through patent agents who have their domicile or residence in Japan.

5. The Guideline attached as an Appendix hereto should be fully reviewed by foreign applicants. The notes and italics appear especially for foreign applicants and are not contained in the original text of the Guideline.

6. The Guideline provides information necessary to patent agents who proceed before the Japanese Patent Office on behalf of foreign applicants. Therefore, foreign applicants are requested to consult fully with patent agents who have their domicile or residence in Japan and are familiar with such information.

Guideline for Accelerated Examination and Accelerated Appeal Examination System for Working-Related Patent (or Utility Model) Applications

Table of Contents

I. Introduction

II. Accelerated Examination System

1. Accelerated Examination
   (1) Applications eligible for accelerated examination
   (2) Accelerated examination procedures
   (3) Public access to documents
   (4) Indication in the official publication ("Kokoku Koho")

2. Submission Procedures—Submission of "Explanation of Circumstances Concerning Accelerated Examination"
   (1) Submitter
   (2) Submission of documents
   (3) Period of submission
   (4) Fee
   (5) Documents to be submitted
   (6) Supplement to submitted documents

3. Preparation of the "Explanation of Circumstances Concerning Accelerated Examination"
   (1) Form
   (2) Bibliography
   (3) State of working
   (4) Prior art investigation and comparison with prior art

4. Inquiry
   (1) Inquiry Window

III. Accelerated Appeal Examination System

1. Accelerated Appeal Examination
   (1) Appeal cases eligible for accelerated appeal examination
   (2) Accelerated appeal examination procedure
   (3) Public access to documents
   (4) Indication in the official publication ("Kokoku Koho")

2. Submission Procedures—Submission of "Explanation of Circumstances Concerning Accelerated Appeal Examination"
   (1) Submitter
   (2) Submission of documents
   (3) Period of submission
   (4) Fee
   (5) Documents to be submitted

3. Preparation of "Explanation of Circumstances Concerning Accelerated Appeal Examination"
   (1) Form
   (2) Bibliography
   (3) State of working
   (4) State of urgency
   (5) Allegations
      (i) Allegations concerning the completeness of specification
      (ii) Allegation against examiner's reasons for refusal

4. Inquiry
   (1) Inquiry Window

Attached Material

Introduction

The Japanese Patent Office is presently working on the promotion of comprehensive measures from a long-term perspective, represented by the following four major items designed to shorten the period of examination and appeal examination in order to deal with a greater number of pending applications:

(1) building up of a so-called "paperless system";
(2) guiding cooperation to improve patent management in domestic corporations;
(3) reformation of the patent system; and
(4) improvement in examination capacity.

As an immediate measure meeting applicants' needs before the establishment of such comprehensive measures, the accelerated examination and appeal examination system will be adopted in respect of working-related applications. The intention is to minimize the adverse effects that could accompany a delay in examination and appeal examination.

In introducing the accelerated examination and appeal examination system, however, a part of the examination capability will be allocated for accelerated examination and appeal examination with due regard to the effect on applications not eligible for accelerated examination and appeal examination. For that reason, the system will be put in practice as a test at the initial stage under certain

conditions limiting the applicable objectives to working-related applications only. The accelerated appeal examination system will also be applied, for the time being, only to those applications of particular urgency among working-related applications in view of the general importance of appeal cases.

From such points of view, applicants or patent agents concerned will be requested to submit the information necessary to justify accelerated examination and appeal examination for the purpose of attaining the goal of the accelerated procedure. At the same time, they will be requested also to select strictly such working-related applications as they really wish to be dealt with in an accelerated manner in order that the purpose of accelerated examination and appeal examination will fully be realized.

II. Accelerated Examination System

1. Accelerated Examination

(1) Applications eligible for accelerated examination.

The Japanese Patent Office may apply accelerated examination to patent (or utility model) applications that satisfy all the conditions mentioned below:

(a) a patent (or utility model) application for an invention that the applicant or one who has been granted a license*1 (licensee) from the applicant in respect of the invention has already worked or the working*2 of which has been scheduled to start by the applicant or his licensee within a period no longer than six months from the date of submission of "Explanation of Circumstances Concerning Accelerated Examination";
(b) examination by an examiner has not yet started;
(c) request for examination has already been made.

(2) Accelerated examination procedures.

(a) When the "Explanation of Circumstances Concerning Accelerated Examination" is submitted to the Patent Office, the Directors of the corresponding examination division shall decide whether or not the application is eligible for accelerated examination. The result of selection shall not be notified in writing.
(b) An examiner shall start promptly the examination of applications selected by the Directors as eligible for accelerated examination and shall speed up the entire examination process to the final decision, including the opposition procedure, without delay.
In the event, however, that the "Explanation of Circumstances Concerning Accelerated Examination" is submitted before the laying-open of applications for public inspection ("Kokai Koho"), the process shall be started promptly after the said laying-open of applications.
(c) As for the description for the state of working under the "Explanation of Circumstances Concerning Accelerated Examination", confirmation of the state of working by hearing or confirmation by field survey may be made if subsequently regarded as necessary.

[*Note 1*] The hearing shall not be open.

(3) Public access to documents.

The "Explanation of Circumstances Concerning Accelerated Examination" shall be open to public access as in the case of other application documents, regardless of the results of selection.

(4) Indication in the official publication ("Kokoku Koho").

Working-related applications concerning which publication is made following the accelerated examination procedure shall be so indicated in the official publication as follows:

(a) indication with certain mark in the table of contents; and
(b) indication of "Application through accelerated examination", in the official publication of patent (or utility model) applications.

2. Submission Procedures—Submission of "Explanation of Circumstances Concerning Accelerated Examination"

(1) Submitter.

A submitter of the "Explanation of Circumstances Concerning Accelerated Examination" for a working-related application eligible for accelerated examination shall be restricted to the applicant of the application concerned.

(2) Submission of documents.

Documents requesting accelerated examination shall either be submitted directly to the receiving window (Second Application Division, Japanese Patent Office; 3-1, Kasumigaseki 1-chome, Chiyoda-ku, Tokyo, Japan) or mailed to the Director General, Japanese Patent Office (4-3, Kasumigaseki 3-chome, Chiyoda-ku, Tokyo 100, Japan) with indication of "Explanation of Circumstances Concerning Accelerated Examination" on the envelope.

[*Note 2*] The contents of this matter relate only to patent agents who have their domicile or residence in Japan.

(3) Period of submission.

The "Explanation of Circumstances Concerning Accelerated Examination" may be submitted at any time after the request for examination has been made.

(4) Fee.

No fee shall be charged for the submission of the "Explanation of Circumstances Concerning Accelerated Examination".

(5) Documents to be submitted.

Documents concerning accelerated examination (the "Explanation of Circumstances Concerning Accelerated Examination") shall be submitted separately for each application requesting accelerated examination. (See II.3, below, for the preparation of the "Explanation of Circumstances Concerning Accelerated Examination".) The said submitted documents shall not be returned after receipt by the Patent Office.

(6) Supplement to submitted documents.

If the "Explanation of Circumstances Concerning Accelerated Examination" is submitted before the laying-

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*1 "License" as used herein includes any license contracted between foreigners.

*2 "Working of inventions" means manufacturing, use, assignment, importing and similar acts within Japan, as defined by Section 2*3 of the Japanese Patent Law.

*3 (Definitions)
2.—(1) "Invention" in this Law means the highly advanced creation of technical ideas by which a law of nature is utilized.
(2) "Patented invention" in this Law means an invention for which a patent has been granted.
(3) "Working" of an invention in this Law means the following acts:
(i) in the case of an invention of a product, acts of manufacturing, using, assigning, leasing, displaying for the purpose of assignment or lease, or importing, the product;
(ii) in the case of an invention of a process, acts of using the process;
(iii) in the case of an invention of a process of manufacturing a product, acts of using, assigning, leasing, displaying for the purpose of assignment or lease, or importing, the product manufactured by the process, in addition to the acts mentioned in the preceding paragraph.

open of the application concerned for public inspection, the supplement procedure for submitted documents shall be requested as follows:

(a) Supplementing documents on prior art investigation and comparison with prior art from the viewpoint of Section 29*bis* of the Patent Law and Section 3*bis* of the Utility Model Law shall be submitted after the laying-open of the application concerned.

[*Note 3*] (i) There are few advantages for both domestic and foreign applicants in submitting the "Explanation Concerning Accelerated Examination" before the laying-open of the applications concerned.

(ii) Since foreign applicants are not requested to investigate patent documents in Japanese unless they so wish, they need not submit a prior art investigation report from the viewpoints of Sections 29*bis* of the Patent Law and 3*bis* of the Utility Model Law.

(b) If all the invention information symbols of the IPC that appeared in the official publication of the said application ("Kokai Koho") are not included in the prior art investigation submitted before the laying-open of the application concerned, supplementary documents on prior art investigation covering fields of art defined by the IPC symbols not included in the original documents, and a comparison with prior art in respect of such additional fields from the viewpoint of Section 29(1) and (2) of the Patent Law and Section 3(1) and (2) of the Utility Model Law shall be submitted after the laying-open of the application concerned.

[*Note 4*] Since foreign applicants are not requested to investigate patent documents in Japanese unless they so wish, they need not submit supplementary documents on the prior art investigation and comparison with prior art from the above viewpoint.

3. Preparation of the "Explanation of Circumstances Concerning Accelerated Examination"

(1) Form

Explanation of Circumstances Concerning Accelerated Examination

To: Mr. Date:
The Director General of the Patent Office
1. Identification of the case:
2. Title of the invention (or utility model) and its IPC symbol appearing in the official publication ("Kokai Koho"): (IPC symbols)
3. Date of the request for examination of application:
4. Submitter (Applicant)
Domicile (residence):
Name: (seal)
5. Agent
Domicile (residence):
Name: (seal)
6. State of working
(1) Specification of the working-related act
(2) Period of working of the invention (or utility model)
(3) Relation between the invention (or utility model) and the specified working-related act
7. Prior art investigation and comparison with prior art
(1) Results of investigation
(2) Comparison with prior art
(3) Other particulars if necessary
8. List of attached documents

[*Note 5*] Contents of this matter relate only to patent agents who have their domicile or residence in Japan.

(2) Bibliography.

The spaces for bibliography (1–5) shall be completed in the following manner:

(a) For the space for "Identification of the case", the patent (or utility model) application number and the laying-open number of the patent (or utility model) application shall be entered. For an international application made in the Japanese language that includes Japan among the designated States or the elected States under the PCT, the patent (or utility model) application number shall be inserted as:

Patent (or utility model) application No.
WO **/*****;

and for an international application made in a foreign language that includes Japan among the designated States or the elected States under the PCT, the number shall be inserted as:

Patent (or utility model) application No.

Secondary publication number of an international application in the Japanese language ("Kohyo Koho") No. ...

(b) The IPC symbols consisting of invention information (the IPC symbols preceding double oblique strokes) appearing in the official unexamined publication of the application concerned ("Kokai Koho") shall be inserted in the space for the IPC symbols.

(c) Next to the domicile of the heading "Submitter (Applicant)" and "Agent", the telephone number of the submitter (applicant) or his agent shall be entered if possible.

(d) Other instruction shall be the same as items 1–3, proviso to 4, 6, 7, 10 and 12–14 of the Notes to Form No. 1 of the Regulations under the Patent Law.

As to the date of submission, the date of delivery in the case of direct submission to the receiving window of the Patent Office or the date of posting or receipt by the post office in the case of mailing shall be inserted.

[*Note 6*] Contents of this matter relate only to patent agents who have their domicile or residence in Japan.

(3) State of working.

The space for "state of working" in the "Explanation of Circumstances Concerning Accelerated Examination" shall be completed as follows:

(a) Specification of the working-related act. It shall be specified and described whether the act within Japan by the applicant or by his licensee comes under manufacturing, using, assigning, leasing, displaying for the purpose of assignment or lease, or importing to Japan.

(b) Period of working of the invention (or utility model). When the working-related act has started or is scheduled to start shall be described. However, the scheduled period within which working is to start shall be restricted to within six months from the date of submission of the "Explanation of Circumstances Concerning Accelerated Examination".

If, for example, the working-related act is manufacturing, the description may be as follows:

"Manufacturing since ..., 19..."; or
"Scheduled for manufacture from ..., 19..."

[*Note 7*] It is not necessary to identify the location of use or name of licensee, and additional materials to describe state of working are not required in principle.

(c) Relation between invention (or utility model) and the specified working-related act. A description shall be given of how the invention (or utility model) that is the subject of the application is applied in the specified working-related act. If, for example, the working-related act is manufacturing, description may be given in that part of the product the art of the invention (or utility model) is applied.

[*Note 8*] The contents of the description in the explanation of the state of working are sufficient if they are provided to the extent as follows:

Examples of the Description in the Explanation of the State of Working

1. *When the working of an invention has commenced*

	Item	*Working by Applicant*
(i)	Specification of the working-related acts	Export to Japan
(ii)	Time of working	Exporting as from (month) 1984
(iii)	Relation between the specified working-related act and the invention concerned	Exporting bolts worked with the invention of this application whose screwdriver setting groove on the bolt-head is made in cross-groove

	Item	*Working by Licensee*
(i)	Specification of working-related acts	Export to Japan
(ii)	Time of working	Our licensee has been exporting as from (month) 1984
(iii)	Relation between the specified working-related act and the invention concerned	Exporting bolts worked with the invention of this application whose screwdriver setting groove on the bolt-head is made in cross-groove

2. *When the working of an invention is scheduled to start within six months from the date of submission of the "Explanation of Circumstances Concerning Accelerated Examination"*

	Item	*Working by Applicant*
(i)	Specification of working-related acts	Export to Japan
(ii)	Time of working	Scheduled to export as from (month) 1986
(iii)	Relation between the specified working-related act and the invention concerned	Preparing the export of bolts worked with the invention of this application whose screwdriver setting groove on the bolt-head is made in cross-groove.

	Item	*Working by Licensee*
(i)	Specification of working-related acts	Export to Japan
(ii)	Time of working	Our licensee is scheduled to export as from (month) 1986
(iii)	Relation between the specified working-related act and the invention concerned	Preparing the export of bolts worked within the invention of this application whose screwdriver setting groove on the bolt-head is made in cross-groove

(4) Prior art investigation and comparison with prior art.

On submitting the "Explanation of Circumstances Concerning Accelerated Examination", a description of the prior art investigation and comparison with prior art is requested to attain the objectives of accelerated examination. The prior art investigation and comparison with prior art should preferably be made in the manner in (a) through (e), below.

(a) Documents to be investigated

(i) The documents to be investigated shall cover at least Japanese unexamined publications, i.e., "Kokai Koho" (including the secondary publication of international applications in Japanese, i.e., "Kohyo Koho").

If, however, the submitter is a foreign applicant, the investigation of Japanese unexamined publications ("Kokai Koho") may be substituted by patent documents written in English, French or German.

(ii) *Depending on the particularity of the art, "specified publications" as shown in the attached material may be designated as documents to be investigated. If, however, the submitter is a foreign applicant, such publications as are in Japanese may be exempted from investigation.*

[*Note 9*] Foreign applicants are requested to investigate patent documents in any of the foreign language listed in (a)(i), above, from the viewpoint of Section 29(2) of the Patent Law and Section 3(2) of the Utility Model Law.

(Patentability of inventions)

29.—(1) Any person who has made an invention which is industrially applicable may obtain a patent therefor, except in the case of the following inventions:

(i) inventions which were publicly known in Japan prior to the filing of the patent application;
(ii) inventions which were publicly worked in Japan prior to the filing of the patent application;
(iii) inventions which were described in a publication distributed in Japan or elsewhere prior to the filing of the patent application.

(2) Where an invention could easily have been made, prior to the filing of the patent application, by a person with ordinary skill in the art to which the invention pertains, on the basis of an invention or inventions referred to in any of the paragraphs of subsection (1), a patent shall not be granted for such an invention notwithstanding subsection (1).

(Registrability of utility models)

3.—(1) Any person who has made a device which is industrially applicable and which relates to the shape or

construction of articles or a combination of articles may obtain a utility model registration therefor, except in the case of the following devices:

(i) devices which were publicly known in Japan prior to the filing of the utility model application;
(ii) devices which were publicly worked in Japan prior to the filing of the utility model application;
(iii) devices which were described in a publication distributed in Japan or elsewhere prior to the filing of the utility model application.

(2) Where a device could very easily have been made, prior to the filing of the utility model application by a person with ordinary skill in the art to which the device pertains, on the basis of a device or devices referred to in any of the paragraphs of subsection (1), a utility model registration shall not be granted for such a device notwithstanding subsection (1).

[*Note 10*] List of "Specified Publications" in (a)(ii), above

Title of Publication	*Related IPC Symbols*
Chemical Abstract	A 01 N, A 61 K C 07 B,C,D,F,G,H,J,K C 09 B,K, D 06 P
Applied Optics	G 02 B, G 03 B, F,H

(b) Extent of investigation. If Japanese unexamined publications are investigated, the extent of investigation shall cover the fields of art at least centered around the IPC symbol or symbols consisting of the invention information (the IPC symbol or symbols preceding double oblique strokes) appearing in the publication of the unexamined application concerned ("Kokai Koho"). In that case, the period of investigation shall extend from 1971 to the date of issue of the publication of the unexamined application concerned ("Kokai Koho").

[*Note 11*] Foreign applicants are not requested to do so, unless they so wish.

(c) Results of investigation.

(i) In the space for results of investigation, the titles of related documents obtained as a result of the prior art investigation shall be described in the manner corresponding to the instruction shown in 42.31A of the "Examination Manual for Patents and Utility Models" compiled by the Patent Office. *If no related document has been found after the prior art investigation, documents showing the general state of the art as technical background to the application may be described.*

In the space for results of investigation, the names of institutions and services, etc., if used, may be entered.

(ii) *Copies of prior art documents shall be attached.*
(iii) *For prior art documents written in a foreign language, the necessary part shall be indicated on a copy of the document and the translation thereof that is submitted. In the case of English documents, a translation may be omitted.*
(iv) *In the place of a prior art investigation by a foreign applicant, documents cited as results of investigations by examining patent offices or intergovernmental organizations or by International Searching Authorities pursuant to the PCT may be entered in the space for the results of investigation.* In the place of a prior art investigation by a domestic applicant, documents cited as results of investigations by International Searching Authorities pursuant to the PCT or by the European Patent Office (EPO) may be entered in the space for the results of investigation. In those cases, the examining patent office or organization that made such investigation shall also be entered.
(v) When submitting the "Explanation of Circumstances Concerning Accelerated Examination" before the laying-open of an application, the IPC symbols which define the fields of art, the investigation of which fields the applicant has made in advance, shall be entered in the space for the result of the prior art investigation, since an additional prior art investigation may become necessary so as to cover all the fields of art defined by the invention information symbols of the IPC appearing in the publication of the unexamined application concerned ("Kokai Koho").

[*Note 12*] Foreign applicants are not requested to do so regarding paragraph (v), above, unless they so wish.

(d) Comparison with prior art.

In the space for comparison with prior art, a concrete and concise description of different points holding the better part of inventions claimed in the patent (or utility model) application and its effect should be given, compared with the prior art described in the listed documents in the light of Sections 29(1) and (2) and 29*bis* of the Patent Law and Sections 3(1) and (2) and 3*bis* of the Utility Model Law. In this case, due consideration should also be given to the completeness of the specification in the light of Section 36 of the Patent Law and Section 5 of the Utility Model Law. The above description should be prepared, for example, in the same manner as in preparing a written argument against the examiner's reasons for refusal.

If it does not seem possible to maintain patentability without amendment of the specification, a draft amendment of the specification shall be presented and the comparison with prior art should be made on the basis of that draft.

If the specification includes a detailed comparison with prior art in the light of Section 29(1) and (2) of the Patent Law and Section 3(1) and (2) of the Utility Model Law, the description in the space for comparison with prior art may be replaced by an indication of the appropriate part of the specification. However, the prior art investigation and comparison with prior art in the light of Section 29*bis* of the Patent Law and Section 3*bis* of the Utility Model Law shall be described.

[*Note 13*] Foreign applicants are not requested to investigate from the viewpoint of Section 29*bis* of the Patent Law or Section 3*bis* of the Utility Model Law.

(e) Other particulars, if necessary.

An applicant that is a small or medium enterprise or an individual may be exempted from the investigation of "specified publications" mentioned in subparagraph (a)(ii), above, and from attachment of copies of prior art documents mentioned in subparagraph (c)(ii), above. If an applicant that is a small or medium enterprise or an individual omits the investigation of "specified publications" and the attachment of copies as mentioned above, the applicant shall state in the space for "Other particulars, if necessary" the fact that the applicant is a small or medium enterprise as provided for in the Small and Medium Enterprise Basic Law or an individual.

For a small or medium enterprise, it is requested to state the type of small or medium enterprise as shown in the following table and also to indicate whether the number of employees and capital fall with the number of employees and capital provided for in the said Law.

Definition of Small and Medium Enterprises Established by the Small or Medium Enterprise Basic Law

Type of business	*Number of Employees*	*Amount of Capital*
Manufacturing, mining, etc.	not more than 300	not more than Y100,000,000
Wholesalers	not more than 100	not more than Y 30,000,000
Retailers and services	not more than 50	not more than Y 10,000,000

4. Inquiry

(1) Inquiry Window.

An answer by telephone shall be given to any inquiry on the matters relating to accelerated examination from an applicant (or patent agent).

Inquiry Window
Coordination Division
Second Examination Department
Japanese Patent Office
Tokyo, Japan
Tel. 03-(501)-1511.

[*Note 14*] Contents of this matter relate only to patent agents who have their domicile or residence in Japan.

III. Accelerated Appeal Examination System

1. Accelerated Appeal Examination

The procedures of accelerated examination shall apply correspon dingly to accelerated appeal examination. The procedures that are particularly different are hereinafter introduc ed.

(1) Appeal cases eligible for accelerated appeal examination.

The Japanese Patent Office may apply accelerated appeal examination to appeal cases concerning patent (or utility model) applications satisfying all the conditions as specified below:

(a) Where the appeal case concerns a patent (or utility model) application for an invention which the demandant or one who has been granted a license*4 (licensee) in respect of that invention from the demandant has already worked or the working*5 of which has been scheduled to start by the demandant or his licensee within a period of no longer than six months from the date of submission of the "Explanation of Circumstances Concerning Accelerated Appeal Examination" and for which the granting of a patent is urgently required by the reason of (i) or (ii), below:

(i) in the case where any third party, without any consent of the demandant, has already worked the invention or in the case where the working of that invention has been scheduled to start by the third party without any prior consent of the demandant;
(ii) in the case where opposition to the grant of the patent was filed at the examination stage.

(b) When an appeal examination by a collegial body in charge has not yet commenced (in such an appeal case, since a patent (or utility model) application has proceeded again to the stage of appeal examination after reconsideration by the former examiner under Section 161*bis* of the Patent Law, appeal examination for the said case shall be deemed not to have started);
(c) Where the appeal case is against examiner's decision of refusal.

[*Note 15*] Accelerated appeal examination applies both to appeal cases proceeding to the appeal stage after the final decision of refusal by an examiner through accelerated examination and appeal cases for which demands for appeals have already been filed.

(2) Accelerated appeal examination procedures.

(a) When the "Explanation of Circumstances Concerning Accelerated Appeal Examination" is submitted to the Patent Office, the head of appeal examiner's group (appeal examiner-in-chief) of the corresponding appeal examiner's group shall decide whether or not the appeal case is eligible for accelerated appeal examination. The results of the selection shall not be notified in writing.

(b) A collegial body in charge shall promptly commence the examination of the appeal case as a case eligible for accelerated appeal examination by the head of appeal examiner's group and shall speed up the entire appeal examination process to the final decision, including the opposition procedure, without delay.

(c) As for descriptions in the space for the state of working, state of urgency, allegations concerning the completeness of the specification and allegations against the reasons for the examiner's refusal of the "Explanation of Circumstances Concerning Accelerated Appeal Examination", a request for the submission of materials, for a hearing or for suitable measures may be made if necessary.

[*Note 16*] Submitted documents and details of hearings are not open.

(3) Public access to documents.

The "Explanation of Circumstances Concerning Accelerated Appeal Examination" shall be open to public access as in the case of other appeal case documents, regardless of the results of selection.

(4) Indication in the official publication.

The procedure for indication in the publication of applications ("Kokoku Koho") through accelerated examination shall apply in the case of accelerated appeal examination.

2. Submission Procedures—Submission of "Explanation of Circumstances Concerning Accelerated Appeal Examination"

(1) Submitter.

A submitter of the "Explanation of Circumstances Concerning Accelerated Appeal Examination" shall be restricted to the demandant of the appeal case concerned.

(2) Submission of documents.

Documents concerning accelerated appeal examination ("Explanation of Circumstances Concerning Accelerated Appeal Examination") shall be either submitted directly to the receiving window (Clerical Division, Appeal Department, Japanese Patent Office; 3-1 Kasumigaseki 1-chome, Chiyoda-ku, Tokyo 100, Japan) or mailed to the Director-General, Japanese Patent Office (4-3), Kasumigaseki 3-chome, Chiyoda-Ku, Tokyo

*4 "License" as used herein includes any license contracted between foreigners with a veiw to implementing such a license in Japan.

*5 "Working of inventions" means manufacturing, use, assignment, importing and similar acts within Japan, as defined by Section 2 of the Japanese Patent Law.

100, Japan) with indication of "Explanation of Circumstances Concerning Accelerated Appeal Examination" on the envelope. (The submission of documents shall be made by patent agents in the case of foreign demandants.)

[*Note 17*] The contents of this matter relate only to patent agents who have their domicile or residence in Japan.

(3) Period of submission.

The "Explanation of Circumstances Concerning Accelerated Appeal Examination" may be submitted at any time after the demand for appeal has been filed.

(4) Fee.

No fee is charged as in the case of accelerated examination.

(5) Documents to be submitted.

The documents concerning accelerated appeal examination ("Explanation of Circumstances Concerning Accelerated Appeal Examination") shall be submitted separately for each appeal case requesting accelerated appeal examination. (Refer to III.3, below, for the preparation of the "Explanation of Circumstances Concerning Accelerated Appeal Examination".)

The said submitted documents shall not be returned after receipt by the Patent Office.

3. Preparation of the "Explanation of Circumstances Concerning Accelerated Appeal Examination"

Form.

Explanation of Circumstances Concerning Accelerated Appeal Examination

Date

To: Mr.
The Director General of the Patent Office

1. Identification of the case
2. Title of invention (or ut ility model) and its IPC symbol appearing in the official publication ("Kokai Koho") (IPC symbol)
3. Submitter (Demandant for Appeal)
   Domicile (residence):
   Name: (seal)
4. Agent
   Domicile in Japan (residence in Japan):
   Name: (seal)
5. State of working
   (1) Specification of the working-related act
   (2) Period of working of the invention (or utility model)
   (3) Relation between the invention (or utitlity model) and the specified working-related act
6. State of Urgency
7. Allegations
   (1) Allegation concerning the completeness of the specification
   (2) Allegation against the examiner's reasons for refusal
8. List of attached documents

The "Explanation of Circumstances Concerning Accelerated Appeal Examination" may be quoted in the space for state of working, if there is no change in the subsequent state of working.

A hearing may be conducted for the submitter on the descriptions in the space for 6, 7 and 8, if necessary.

[*Note 18*] The contents of this matter relate only to patent agents who have their domicile or residence in Japan.

(2) Bibliography.

The space for bibliography (1–4) in the "Explanation of Circumstances Concerning Accelerated Appeal Examination" shall be completed as follows:

(a) For the space "Identification of the case", the appeal case number, patent (or utility model) application number and the laying-open number of the patent (or utility model) application shall be entered.

(b) The IPC symbols consisting of the invention information (the IPC symbols preceding double oblique strokes) appearing in the official unexamined publication of the application concerned ("Kokai Koho") shall be inserted in the space for IPC symbols.

(c) Next to the domicile under the headings "Submitter" and "Agent", the telephone number of the submitter or his agent shall be entered, if possible.

(d) Other instructions shall be the same as in items 1–3, 6, 7, 10 and 12–14 of the Notes to Form No. 1 of the Regulations under the Patent Law.

As to the date of submission, the date of delivery in the case of direct submission to the receiving window of the Clerical Division, Appeal Examination Department, Patent Office, or the date of posting or receipt by the post office in the case of mailing, shall be inserted.

[*Note 19*] The contents of this matter relate only to patent agents who have their domicile or residence in Japan.

3. State of working.

The space for "State of working" in the "Explanation of Circumstances Concerning Accelerated Appeal Examination" shall be completed as follows:

(a) Specification of the working-related act. Whether the act within Japan by the demandant or his licensee comes under manufacturing, using, assigning or leasing, displaying for the purpose of assignment or lease, or *importing to Japan* shall be specified and described.

(b) Period of working of the invention (or utility model). When the working-related act has started or is scheduled to start shall be described. However, the scheduled period to start working shall be restricted to within six months from the date of submission of the "Explanation of Circumstances Concerning Accelerated Appeal Examination".

If, for example, the working related act is manufacturing, the description may be as follows:

"Manufacturing since ..., 19..."; or
"Scheduled for manufacture from ..., 19 ...,"

[*Note 20*] It is not necessary to identify the location of the use and name of the licensee, and additional materials to describe the state of working are not required in principle.

(c) Relation between the invention (or utility model) and the specified working-related act. A description shall be provided of how the invention (or utility model) of the application is applied in the specified working-related act. If, for example, the working-related act is manufacturing, a description shall be provided of to what part of the product the art of the invention (or utility model) is applicable.

(4) State of urgency.

In the space for "State of Urgency", an explanation shall be given of at least one of the following cases as provided in (a) or (b) where urgent granting of the patent is required.

If the matters necessary for clarifying such state fall within the scope of corporate secrecy and it may interfere with commercial dealings to submit such matters, the omission of the submission of such matters may be allowed by indicating that the demandant is prepared to clarify such matters in hearing.

The details of such a hearing shall not be open.

(a) Where any third party, without consent of the demandant, has already worked the invention or has scheduled to start the working of the invention in an apparent manner.

Where a state of urgency is explained by this case, clarification of (A) the third party, (B) the working-related act by any third party and (C) the relation between the working-related act and the inventions claimed in the application concerned is required in principle. Where the third party has scheduled to start in an apparent manner the working of inventions claimed in the application concerned, clarification of the state of the schedule for working is required by means of attaching objective documents or other reliable materials.

A "third party" means any party other than the demandant in the appeal case and his licensee.

(b) When opposition to the grant of patent was filed in the stage of examination.

Where a state of urgency is explained by this case, the circumstances behind the grounds for the oppositions to the grant of the patent shall be explained in relation to inventions claimed in the patent (or utility model) application concerning which the examiner's decision of refusal has been brought about.

(5) Allegations.

Since it is necessary for an efficient accelerated appeal examination that the specification be complete and that the grounds against the reasons for refusal be based on the detailed description in the specificaiton, the following allegations are requested to be described for clarifying those matters.

(i) Allegation concerning the completeness of specification. In the space for "Allegation concerning the complet eness of the specification", it shall be alleged that the explanation is complete in the following respects:

(a) It shall be explained, according to "the itemized descriptions of patent (or utility model) specification" specified in the Regulations (Note 14 to Form No. 16 of the Regulations under the Patent Law and Note 13 to Form No. 3 of the Regulations under the Utility Model Law), for example, how the purpose, constitution and effects of the invention (or utility model) are clearly described in the space for a detailed explanation of the invention:

[*Note 21*] Example where itemized description is preferable:

Detailed Description of the Invention

(a) Industrial Field of Utilization
(b) Prior Art
(c) Problems that the Invention is to solve
(d) Means of Solving the Problems
(e) Operation of the Invention
(f) Working Examples
(g) Effects of the Invention

(b) It shall be explained how the constitution of the claimed invention (or utility model) is accurately described in the space for a detailed explanation of the invention.

The explanations in (a) and (b), above, may be omitted where the patent (or utility model) application has been published in the examination stage in the official publication ("Kokoku Koho").

(ii) Allegation against examiner's reasons for refusal. In the space for "Allegation against examiner's reasons for refusal", the grounds against the examiner's reasons for refusal shall be concretely alleged indicating the duly corresponding described parts in the specification.

4. Inquiry.

(1) Inquiry Window.

An answer by telephone shall be given to any inquiry on the matters relating to accelerated appeal examination from a demandant (or his patent agent).

Inquiry Window
Clerical Division
Appeal Examination Department
Patent Office
Tel. 03-581-1101

[*Note 22*] Contents of this matter relate only to patent agents who have their domicile or residence in Japan.

Attached Material
List of Specified Publications

Title of Publication	*Related IPC Symbols*
Chemical Abstract	A 01 N, A 61 K C 07 B,C,D,F,G,H,J,K C 09 B,K, D 06 P
Applied Optics	G 02 B, G 03 B, F,H

Status of PTO Services

The following is an update of the status of PTO services for February 1986:

Service Item	FY 1985 Goal (Calendar Days)	FY 1986 Goal (Calendar Days)	Monthly Average (Calendar Days)
Filing Receipts:			
Patents	22	22	36
Trademarks	30	30	32
Patent/Trademark Copies:			
Special Window Coupons	1	1	.4
Window Coupons	5	5	1.8
Mail Coupons	29	26	17
Letter Orders	34	26	17
Date of oldest unfilled order			Feb. 20, 1986
Current Mail Date being processed			Feb. 21, 1986
Certified Copies:			
Trademark Registrations	30	30	20
Applications-As-Filed	20	10	75% within 10 days
File-Wrapper/Contents	N/A	N/A	95% within 7 days
Walk-up Certification	1	1	51% within 24 hours
Trademark Search Library:			
Filing Pending Marks	21	21	29
Filing Reg. Certificates	3	Issue Date	7 Days Late
Assignments:			
Patents	25	20	19
Trademarks	25	20	18
Avg. Days from Issue Fee Payment to Issue Date	90–100	90–100	117
Issue Fee Receipts Mailed	4 weeks prior to Issue Date	4 weeks prior to Issue Date	On schedule
Patent Copies Available	Issue Date	Issue Date	93% on Issue Date
Trademark Copies Available	Issue Date	Issue Date	99% on Issue Date

IMPROVEMENTS IN SERVICES

- *File Information Unit* — At a recent users meeting, a concern was raised regarding the inability of the File Information Unit (FIU) to override erroneous location data in the PALM system when ordering a patent or abandoned file from the Eads Street Repository. An example of this situation would be when a customer requests a particular file and the PALM system indicates that the file is in one of the Patent Examining Groups. The customer then goes to the Group to request access to the file, but discovers the file is not in the Group. He/she would return to the FIU and submit a charge slip that would have to be hand carried to the Repository.

  A change to the PALM software now allows the FIU to override the PALM system and electronically order the file from the Repository. The printout at the Repository also identifies this request as a priority to ensure special handling of the request.

  This new procedure will reduce the amount of time and effort required to order a file when the PALM system indicates an incorrect location.

- *Improvements* — At the suggestion of a member of the Patent, Trademark and Copyright Law Section of the Bar Association of the District of Columbia, a check off box is being added to the PTOL–85c Issue Fee Transmittal to indicate authority to charge deficiencies in fees to a deposit account. This will avoid the issuance of Notices of Abandonment when the issue fee amount due is not satisfied by the fee remittance. It will also avoid delays in responding to associated requests for advanced patent order or assignment recordation.

HELPFUL HINTS FROM THE PTO

- *Response to Final Rejection — Expedited Processing and Reply by PTO*

  Many amendments or responses after Final Rejection are filed without the proper markings needed to ensure the "quick reply" benefits of the Expedited Procedure.

  In view of the enormous volume of mail and papers received in the PTO each day, it is essential that these special amendments or responses be clearly and distinctly marked so that the staff in the Mail Room, Finance Branch, and Patent Examining Corps Clerical Sections can readily identify them as After Final (AF) papers. When properly marked, they receive immediate attention and special handling throughout the PTO.

  The marking requirements are as follows:

1. Mark the mailing envelope "BOX AF" in the lower left corner.
2. Mark the paper, in the upper right portion:

"RESPONSE UNDER 37 CFR 1.116
EXPEDITED PROCEDURE
EXAMINING GROUP (Insert Group Number)".

3. Do not mail After Final (AF) papers and other, non-AF, papers in the same envelope.
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"RESPONSE UNDER 37 CFR 1.116
EXPEDITED PROCEDURE
EXAMINING GROUP (Insert Group Number)".

5. Use a bright color felt point marker to make the markings prominent.
6. It would be helpful to print "AF" in bright color at the top of all After Final responses or amendments.

Applicants are encouraged to use this expedited procedure in order to facilitate rapid PTO processing and reply to amendments and responses after Final Rejection.

Direct questions to: Al Lawrence Smith
Director, Group 350
(703) 557-3414

- *Assignments* — When requesting correction or updating of a previously recorded patent or trademark assignment document, providing the reel and frame number of that document to the Assignment Branch will greatly expedite the recording process.
To ensure the correct printing of ownership information on a Trademark Registration at issue date, provide the Trademark Office examining attorney with the reel and frame number of the appropriate assignment document as soon as you are notified of it.

- *File Wrapper Continuation* — To expedite processing under Rule 1.62, make certain that the parent serial number cited in the transmittal letter is the correct serial number.

- *Continuation or Divisional Application* — When filing under Rule 1.60 retain at least one original claim from the parent application to assure a complete application. Only amendments reducing the number of claims or adding a reference to the prior application (Rule 1.78 (a)) will be entered, upon request, before calculating the filing fee and granting the filing date. *Reminder*: Applicant cannot file a CIP (continuation-in-part) under Rule 1.60.

- *Petition for License* — Rule 5.12 states that "filing of an application for patent for inventions made in the United States will be considered to include a petition for license under 35 U.S.C. 184 for the subject of the application. The filing receipt will indicate a license is granted". There is no need to request a corrected filing receipt deleting the words "License Granted". Its intent is to provide the necessary acknowledgement for those filing abroad.

For the prior four items direct questions to:

Peggy Dubose, Manager
Examining Services Division
(703) 557-3256

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Box 12	—	Contributions to the Examiner Education Program.
Box AF	—	Amendments or Correspondence after Final Rejection of patent applications.
Box Interference	—	Communications relating to Interferences and applications and patents involved in Interference.
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Box Pat. Ext.	—	Applications for patent term extension.
Box PCT	—	Mail related to applications filed under the Patent Cooperation Treaty.
Box Reexam	—	Mail related to reexamination applications.

Mar. 3, 1986.

THERESA A. BRELSFORD,
Assistant Commissioner
for Administration.

PATENT NOTICES

Certificates of Correction for the Week of Mar. 25, 1986

4,243,489	4,524,077	4,549,698	4,558,609
4,287,890	4,529,228	4,549,798	4,558,639
4,290,115	4,529,916	4,550,195	4,558,739
4,397,628	4,530,314	4,550,474	4,559,596
4,423,324	4,530,592	4,550,641	4,559,956
4,433,379	4,531,461	4,551,481	4,560,159
4,441,843	4,531,972	4,551,633	4,560,243
4,446,400	4,532,278	4,551,643	4,560,286
4,461,069	4,532,613	4,551,695	4,560,455
4,480,068	4,532,811	4,551,710	4,560,837
4,487,139	4,533,310	4,551,838	4,560,871
4,495,678	4,536,407	4,552,364	4,560,990
4,496,473	4,536,684	4,553,501	4,561,128
4,497,573	4,537,903	4,553,553	4,561,334
4,500,545	4,538,988	4,553,569	4,561,950
4,506,735	4,540,138	4,554,165	4,562,296
4,508,573	4,540,470	4,555,359	4,562,361
4,510,114	4,540,656	4,555,448	4,562,490
4,513,149	4,541,254	4,555,634	4,562,526
4,514,081	4,542,602	4,555,969	4,562,607
4,514,331	4,543,031	4,556,289	4,562,625
4,514,713	4,543,769	4,556,429	4,563,343
4,518,973	4,544,534	4,556,509	4,563,415
4,519,359	4,545,738	4,556,549	4,563,559
4,519,924	4,545,818	4,556,562	4,563,702
4,519,993	4,546,421	4,557,199	4,563,721
4,521,995	4,546,731	4,557,296	4,563,754
4,523,022	4,547,312	4,557,340	4,564,281
4,523,628	4,547,774	4,557,498	4,565,904
4,523,803	4,548,839	4,557,627	
4,523,953	4,548,994	4,558,449	

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

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Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
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Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware Library	(302) 451-2238
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
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	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
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	Milwaukee Public Library	(414) 278-3247

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*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF February 15, 1986

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	3-01-85
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-15-84
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-12-84
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	3-01-85
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	3-02-84
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	8-11-83
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	11-21-83
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—E. E. KUBASIEWICZ, Director	6-15-84
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	3-28-83
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	8-30-83
DESIGN, GROUP 290—K. L. CAGE, Director	1-03-84
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	7-12-83
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	7-26-84
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	3-30-83
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	10-19-83
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	1-09-85

Expiration of patents: The patents within the range of numbers indicated below expire during February 1986, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,425,060 to 3,426,359, inclusive

Plant Patents ..... Numbers 2,861 to 2,869 inclusive

REISSUES

MARCH 25, 1986

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,094

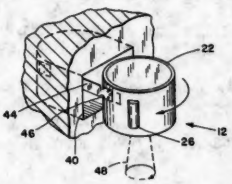
OVERFLYING MUNITIONS DEVICE AND SYSTEM

John V. Atanasoff, East Greenwich, R.I.; W. Kenneth Clark, Lowell, Mass.; David Henderson, Carlisle, Mass., and Kenneth W. Wreghitt, Andover, Mass., assignors to Avco Corporation, Wilmington, Mass.

Original No. 4,356,770, dated Nov. 2, 1982, Ser. No. 92,898, Nov. 9, 1979. Application for reissue Oct. 31, 1984, Ser. No. 666,870

Int. Cl.[4] F42B *25/24*

U.S. Cl. 102—384 **31 Claims**



1. A munitions system comprising:

a missile having a projectile mounted for downward firing from the bottom of the missile;

means for propelling the missile along a *ballistic* trajectory to overfly a target;

stabilizing means for stabilizing the missile in flight with the projectile directed downward;

means for imparting a lateral precession motion to the missile relative to the [target] *trajectory;*

detector means carried by the missile for detecting a target below the missile; and

means carried by the missile for propelling the projectile downward from the missile toward the target upon detection of the target.

Re. 32,095

COOKED FLAVORS FOR SMOKING PRODUCTS

D. Louise Wu, and James W. Swain, both of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Original No. 4,379,464, dated Apr. 12, 1983, Ser. No. 235,456, Feb. 18, 1981. Application for reissue Jan. 13, 1984, Ser. No. 570,719

Int. Cl.[4] A24B *3/12, 15/30*

U.S. Cl. 131—275 **12 Claims**

1. A process for preparing a reaction flavor product which comprises the following steps:

(a) Preparing a mixture of a reducing sugar [and] ammonium hydroxide *and a trace amount of a compound selected from the group consisting of an amino acid and a monoamide thereof,* wherein the weight ratio of reducing sugar to ammonium hydroxide (*30%*) is in the range of 5–15:1 *and the ratio of reducing sugar to said compound is in the range of 200–300:1;*

[(b) adding a trace amount of a compound selected from the group consisting an amino acid and a monoamide thereof to said mixture of step (a), wherein the ratio of reducing sugar to said compound is in the range of 200–300:1;]

[(c)] (*b*) heating said mixture to a temperature in the range of 90° to 105° C.; and thereafter

[(d)] (*c*) cooling said mixture to room temperature.

Re. 32,096

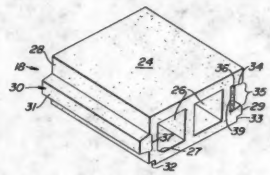
END BLOCK

Ernest H. Jeffries, Jr., Greensboro, N.C., assignor to Resco Products, Inc., Norristown, Pa.

Original No. 4,320,612, dated Mar. 23, 1982, Ser. No. 178,249, Aug. 15, 1980. Division of Ser. No. 15,038, Feb. 26, 1979, Pat. No. 4,243,385. Application for reissue Mar. 5, 1984, Ser. No. 586,373

Int. Cl.[4] E27D *3/12;* E04C *1/10, 1/30*

U.S. Cl. 52—396 **11 Claims**



1. An end block designed for use on a kiln car comprising a refractory body having top and bottom horizontally disposed major faces and two vertically disposed end faces, a transverse projection extending from end face thereof generally parallel to said major faces and a transverse recess extending into an opposite end face thereof, said recess having means for retaining a layer of resilient refractory material therein without the use of fastening means for contact with a corresponding projection of another block, said retaining means comprising the shape of said recess such that the innermost surface of said recess has a vertical dimension greater than the vertical dimension of [any other] *another* portion of said recess and whereby the smallest vertical dimension of said recess is greater than the largest vertical dimension of said projection so that said corresponding projection of another block can enter said recess with a loose fit, and said projection having a cross-sectional shape different from the cross-sectional shape of said recess.

Re. 32,097

BLENDED GRAIN DIRECT-POSITIVE EMULSIONS AND PHOTOGRAPHIC ELEMENTS AND PROCESSES FOR THEIR USE

Robert A. Silverman, Rochester, and Harry A. Hoyen, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Original No. 4,444,865, dated Apr. 24, 1984, Ser. No. 418,314, Sep. 15, 1982. Continuation-in-part of Ser. No. 320,903, Nov. 12, 1981, abandoned. Application for reissue Jul. 2, 1984, Ser. No. 627,006

Int. Cl.[4] G03C *1/02, 1/36, 7/00*

U.S. Cl. 430—217 **34 Claims**

1. A radiation-sensitive emulsion particularly adapted to forming a direct-positive image comprised of

a dispersing medium

a first, core-shell silver halide grain population having a coefficient of variation of less than 20%, and

a second silver halide grain population capable of *internally forming a latent image by* internally trapping photolytically generated electrons and substantially incapable of forming a surface latent image within the direct-positive exposure latitude of the first grain population,

said second grain population having an average diameter less than 70% that of said first grain population, and

said first and second silver halide grain populations being present in a weight ratio of from 5:1 to 1:5.

Re. 32,098

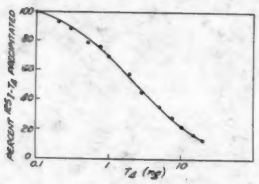
RADIOIMMUNOASSAY FOR MEASUREMENT OF THYROXINE (T_4) AND TRIIODOTHYRONINE (T_3) IN BLOOD SERUM

Inder J. Chopra, Los Angeles, Calif., assignor to Research and Education Institute, Inc., Torrance, Calif.

Original No. 3,911,096, dated Oct. 7, 1975, Ser. No. 265,586, Jun. 23, 1972. Application for reissue Aug. 10, 1978, Ser. No. 932,759

Int. Cl.[4] G01N *33/56, 33/56, 33/60;* **G01T** *1/00*

U.S. Cl. 424—1 **11 Claims**



1. A method of measurement of the concentration of a particular thyroid hormone selected from the group consisting of thyroxine (T_4) and triodo-L-thyronine (T_3) in unextracted human serum, which comprises:

A: adding to a measured quantity of unextracted human serum,

a. a blocking agent *selected from the group consisting 8-anilino-1-napthalene sulfonic acid and 3-(4-anilino-1-naphthylazo) 2,7 naphthalene disulfonic acid, and present* in an amount sufficient to displace essentially all of said particular thyroid hormone to be measured from thyroxine-binding globulin (TGB),

b. buffering ions to buffer said serum to a pH of between about 6.8 to about 9.6,

c. radioactive thyroid hormone, of the type to be measured, in an amount which will give a measurable counting rate of either antibody bound or free radioactivity after reaction equilibrium has been reached as set forth in Step B below; and

d. an antibody in sufficient quantity to bind a significant quantity of said radioactive thyroid hormone in the absence of any of the particular nonradioactive thyroid hormone to be measured,

B: allowing reaction of both particular thyroid hormone, to be measured, and said radioactive thyroid hormone, with said antibody to proceed substantially to equilibrium to thereby produce antibody bound radioactive thyroid hormone;

C: separating said antibody bound radioactive thyroid hormone, to be measured from said free radioactive thyroid hormone;

D: measuring the quantity of radioactive thyroid hormone selected from antibody bound radioactive thyroid hormone and free radioactive thyroid hormone;

E: preparing a standard curve with known amounts of the particular thyroid hormone to be measured, and

F: correlating the quantity of radioactive thyroid hormone measured with a known amount of said particular thyroid hormone read from said standard curve.

Re. 32,099

OPTICAL PRINTER

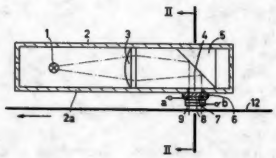
Bernhard Hill; Klaus Schmidt, and Gerhard Graf, all of Siegen, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Original No. 4,278,981, dated Jul. 14, 1981, Ser. No. 21,127, Mar. 16, 1979. Application for reissue Sep. 13, 1982, Ser. No. 416,838

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1978, 2812206

Int. Cl.[4] G01D *9/42*

U.S. Cl. 346—108 **4 Claims**



5. An optical printer which comprises:

a light source,

a photosensitive record carrier disposed in spaced relation to said light source,

means for forming characters in situ, said means being responsive to electronic signals from an associated character generator, said means for forming being disposed between said light source and said photosensitive record carrier, said means for forming including a template which is a light switching mask including means selectively varying the light transmission through each of a plurality of points, the number of said points being sufficient to provide a high resolution,

said means for selectively varying the light transmission including integrated thin-film technology light switching elements and means for controlling said switching elements electronically with the associated character generator.

PLANT PATENTS

GRANTED MARCH 25, 1986

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,697

TUMMELBERRY

Derek L. Jennings, Dundee, Scotland, assignor to National Seed Development Organisation Limited, Newton, England

Filed Jun. 5, 1984, Ser. No. 617,392

Int. Cl.[4] A01H *5/03*

U.S. Cl. Plt.—46 1 Claim

1. A new and distinct variety of hybrid Rubus substantially as herein shown and described.

5,698

IMPATIENS PLANT NAMED VISTA IMPATIENS NO. 44

Claude Hope, Cartago, Costa Rica, assignor to Pan American Plant Co., Parrish, Fla.

Filed Dec. 29, 1983, Ser. No. 566,504

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 1 Claim

1. A new and distinct cultivar of impatiens plant known by the cultivar name Vista Impatiens No. 44, as described and illustrated, and characterized by its large and brilliant lavender colored flowers with a white eye; profuse blooming, dark green foliage, compact, dense and spreading form, good self-branching habit, and moderate rate of growth, making it ideal for hanging baskets, pot culture and bedding plant use.

5,699

IMPATIENS PLANT NAMED VISTA IMPATIENS NO. 60

Claude Hope, Cartago, Costa Rica, assignor to Pan American Plant Co., Parrish, Fla.

Filed Dec. 29, 1983, Ser. No. 566,804

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 1 Claim

1. A new and distinct cultivar of impatiens plant known by the cultivar name Vista Impatiens No. 60, as described and illustrated, and characterized by its very large, vivid dark salmon color flowers with a half eye, profuse blooming, dark green foliage, good self-branching habit, good keeping qualities, and tall, upright, and spreading form, making the cultivar suitable for bedding plants, hanging baskets and container culture.

5,700

AFRICAN VIOLET PLANT NAMED IMPROVED ORLANDO

Reinhold Holtkamp, Isselburg, Fed. Rep. of Germany, assignor to Gesellschaftsvertrag uber die Erglndergemeinschaft "OPTIMARA", Fed. Rep. of Germany

Filed Jan. 5, 1984, Ser. No. 568,449

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—69 1 Claim

1. A new and distinct cultivar of African violet plant named Improved Orlando, as described and illustrated, and particularly characterized by its compact growth habit, girl-type leaves, short, sturdy and upright flower stems each carrying 7 and more violet shaped and frilled flowers, intensive violet blue flower color, compact flower bouquet, long lasting and non-dropping flowers, and by its ability to produce a saleable plant in 9–10 weeks after potting.

5,701

AFRICAN VIOLET PLANT NAMED MAUI

Reinhold Holtkamp, Isselburg, Fed. Rep. of Germany, assignor to Gesellschaftsvertrag uber die Erglndergemeinschaft "OPTIMARA", Fed. Rep. of Germany

Filed Jan 3, 1984, Ser. No. 568,438

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—69 1 Claim

1. A new and distinct cultivar of African violet plant named Maui, as illustrated and described, and particularly characterized by its relatively large dark lilac flowers with white edges, with the flowers being carried on strong flower stems; vigorous and uniform growth habit, dark green and serrated leaves, and by its floriferous habit, with a large and full bouquet of flowers being positioned centrally above the leaves.

PATENTS

GRANTED MAR. 25, 1986

ERRATA

For CLASS	See PATENT NO.
123–090	4,577,592
175–025	4,577,614
008–115	4,578,166
422–057	4,578,282
435–068	4,578,335
435–088	4,578,336

PATENTS

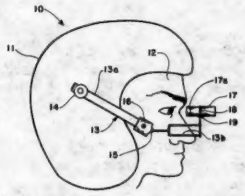
GRANTED MARCH 25, 1986

GENERAL AND MECHANICAL

4,577,346
ATHLETIC PADDED GARMENT
Bradley G. Hall, 60 Redcar Ave., Islington, Ontario, Canada M9B 1K1
Filed Nov. 28, 1984, Ser. No. 675,776
Int. Cl.[4] A41D *13/00*
U.S. Cl. 2—2 **19 Claims**

1. Protective sports garment comprising:
a plurality of padded generally flat rings designed to extend about the wearer adjacent the waist area,
the length dimension of said rings extending about the waist and the width dimension being approximately parallel to the wearers body, when worn,
each of said padded rings being attached to adjacent extents at attachment locations at the front and back of the garment,
arranged in overlapping relationship in the upright attitude of the wearer,
adjacent ones of said rings being connected to allow relative movement therebetween in the extents between the front and the back of the garment.

4,577,347
DIRECT VIEW HELMET MOUNTED TELESCOPE
Thomas R. Connon, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Jul. 25, 1984, Ser. No. 634,247
Int. Cl.[4] A42B *3/02*
U.S. Cl. 2—6 **5 Claims**



1. An improved helmet including means for telescopically acquiring a field of view for the wearer of said helmet, comprising:
(a) a hinged boom having first and second ends, and including first and second parts hingedly joined intermediate said ends;
(b) means for pivotally mounting said boom at said first end to the side of said helmet for pivotal movement of said first part in a plane substantially tangent to said helmet at the point of mounting;
(c) means for hingedly joining said second part of said boom to said first part for pivotal movement of said second part relative to said first part out of said plane;
(d) a telescope; and
(e) means for pivotally mounting said telescope to said boom at said second end thereof, whereby said telescope may be selectively rotated from a stored position beside said helmet to an operative position in front of said wearer.

4,577,348
GAS-TIGHT PROTECTIVE GARMENT WITH HOOD
Wilfried Hoffmann, Berlin, Fed. Rep. of Germany, assignor to Auergesellschaft GmbH, Berlin, Fed. Rep. of Germany
Filed Aug. 11, 1982, Ser. No. 407,122
Int. Cl.[4] A62B *17/00*
U.S. Cl. 2—84 **7 Claims**

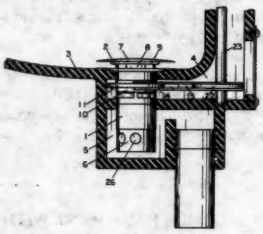
1. A hooded protective garment in which the front wall of a flexible hood has an opening provided with a rigid curved facepiece lens of a given peripheral profile mounted gas-tight therein, characterized in that in the region of the opening for the facepiece lens in the hood the protective garment is firmly attached to and framed by an annular curved frame which conforms to said given peripheral profile, the frame being bound by an overlapping frame of garment material, thus forming a firm connecting rim portion of said frame which is essentially coplanar with respective adjacent peripheral portions of said faceplate lens, and an elastic coupling gasket disposed between and in sealing engagement with peripheral portions of said connecting rim portion and said adjacent coplanar peripheral protions of the rigid curved facepiece lens whereby said gasket secures said facepiece lens with respect to said connecting rim portion continuously along the respective peripheries thereof and constitutes a continuous gas-tight seal between the hood and the facepiece lens.

4,577,349

SINK OUTLET VALVE

John E. Clegg, 2320 Keystone Dr., Orlando, Fla. 32806

Filed May 28, 1985, Ser. No. 737,832
Int. Cl.[4] E03C *1/23*
U.S. Cl. 4—203 **1 Claim**



1. A basin outlet valve comprising a vertical fixed tubular casing having a circular top flange, a tubular walled outlet valve having a circular plate attached to the top of said tubular portion with said tubular portion mounted inside said casing, a vertical operating rod having a revolving crank disk attached to the bottom thereof, a revolving collar encircling the upper portion of said casing, a horizontal yoke having two opposed arms, said yoke being mounted between said crank disk and said revolving collar,

a series of four inlet ports arranged in a circle in said wall of said valve to allow water to flow from said basin into said valve,

an O-ring secured to said valve below said plate to make contact with an upper surface of said flange and serving as means of shutting off the flow of water when said valve is lowered in said casing,

a flange having a slot therein, said flange being secured to said collar and communicating with at least one of said arms of said yoke via a crank pin attached to said one of said arms, said pin engaging said slot in said flange and serving as a means of revolving said collar when linear movement is applied to said yoke,

a horizontal slot in said casing,

an inclined cam slot in said valve adjacent to said horizontal slot,

a cam pin secured through said collar and projecting through said horizontal slot in said casing to engage said inclined cam slot and serving as a means of lowering and raising said valve with respect to said casing when said collar is revolved,

a pin secured in said casing,

a vertical slot in said valve engaging said pin in said casing and serving as a means of preventing said valve from revolving with respect to said casing while allowing said valve to be disengaged from said casing by lifting,

a slot in said revolving crank disk, and

a crank pin in said yoke engaging said disk slot and serving as a means of imparting linear movement to said yoke when said operating rod is revolved, which movement further imparts rotation to said collar via said crank pin and flange slot, which rotation further causes said cam pin to force said valve open or closed by contact with said cam slot.

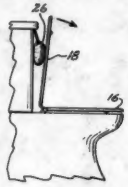
4,577,350

DEVICE TO AUTOMATICALLY LOWER A LIFTED TOILET SEAT

Emmett T. Clark, Rte. 1, Box 442, Pittsboro, N.C. 27312

Filed Apr. 8, 1985, Ser. No. 720,964
Int. Cl.[4] A47K *13/00*
U.S. Cl. 4—251 **7 Claims**

1. Apparatus for moving a hinged toilet seat or toilet cover from an open generally upright position on one side of the vertical plane of its hinge, to a lowered position on the bowl on the other side of the vertical plane of the hinge, by forcing the seat or lid through an overcenter position on the hinge to then pivot to the lowered position by gravity, said apparatus comprising, a hollow collapsible device containing air at ambient pressure, a check valve associated with the device for permitting rapid expelling of air from the device in response to compression and collapsing thereof, said hollow device including resilient means for expanding the device to its original shape, means for mounting said collapsible device at a location adja-



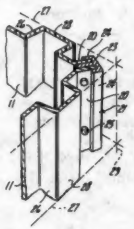
cent an upright surface such that the device is suffiently compressed and collapsed by the upper surface of the lid or seat upon movement thereof to the generally upright position so that the lid or seat remains in the upright position, an air bleed means associated with the collapsible device for permitting the device to reinflate slowly within a predetermined period of time after it is collapsed, said device being so mounted and of such an inflated size that the seat or lid is forced to said overcenter position and descends as said device expands to its original shape.

4,577,351

PORTABLE TOILET CABANA

George W. Harding, Clearwater, Fla., assignor to Poly-John Enterprises Corp., Whiting, Ind.

Filed Oct. 30, 1984, Ser. No. 666,560
Int. Cl.[4] A47K *11/02*
U.S. Cl. 4—460 **3 Claims**



1. A portable toilet-type cabana comprising:

vertically arranged, relatively resilient plastic sheet walls which are fastened together along their adjacent vertical edges;

the adjacent vertical edge portions of at least one pair of such walls being bent into parallel, spaced apart, vertically elongated flanges that are arranged at roughly 45° angles to their respective walls;

a substantially T-shaped in cross section, vertically elongated, corner connector strip arranged with the stem of the T-shape between and in face to face contact with the respective flanges substantially throughout the entire length of said flanges and mechanically secured together with said flanges;

the head of the T-shaped connector overlying and generally in face to face contact with the free ends of each of the flanges;

integral, vertically arranged, relatively narrow channels formed in the walls closely adjacent to, but spaced a short distance from the junctures of their edge flanges with the vertical walls, with the channels opening inwardly of the cabana so that their bases and side walls are spaced outwardly of the planes of their walls;

and the channels being sufficiently deep so that the bases of the channels are located in planes that are further outwardly of the planes of their walls, that is, relative to the interior of the cabana, than are the opposite ends of the head of the T-shaped corner connector, wherein the channels from relatively resilient, protective bumpers for the corner joint between the cabana walls, including the T-shaped corner connector, as well as form hand grips for manually grasping the cabana at its corner for moving the cabana;

and with the flanges and stem being mechanically fastened together by rivets extended through them to form a three layer, structural reinforcing strip at the cabana corner.

4,577,352

EXTRUDED SECTION FOR SWIMMING POOL ROLLABLE COVER

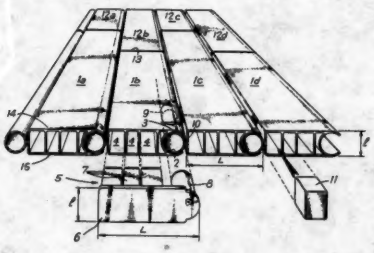
Lucien Gautheron, 1, rue Louis, 92160 Antony, France

Filed Sep. 7, 1984, Ser. No. 648,310

Claims priority, application France, Sep. 14, 1983, 83 14614

Int. Cl.⁴ E04H *3/19*

U.S. Cl. 4—499 **8 Claims**



1. In a swimming pool cover consisting of a plurality of longitudinally extending compartmented, interconnected and articulated sections, the combination comprising:

at least two sections, each including upper and lower major faces interconnected by longitudinal side walls and further including at least one longitudinally extending compartment defining openings at each end of said section;

connecting means extending outwardly along each side wall, each of complementary configuration with respect to the connecting means on an adjacent section and configured to permit articulation of each section within a predetermined range with respect to the next section of said plurality of interconnected sections when interconnected;

one of said connecting means on each section being of substantially hollow circular cross-section open at each end and defining a male element, the other of said connecting means on each section being of discontinuous arcuate cross-section and defining a female receptacle dimensioned to partially encircle said male element when said male and female connecting means are interconnected, and

an end plug for each end of each section, said plug having a base plate, and including means defining a projection mounted thereon configured to enter and seal the open circular end of said male connecting means on the adjacent section and preclude relative longitudinal displacement of a pair of interconnected male and female elements while permitting relative articulation within said predetermined range, said end plug further including at least one additional projection configured to enter and seal the open end of said compartment.

4,577,353

AIR-REGULATION DEVICE FOR THE INLET NOZZLES OF A WHIRLPOOL BATH

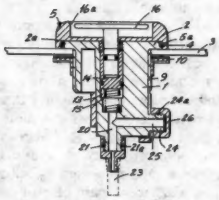
Walter Viegener, Attendorn, Fed. Rep. of Germany, assignor to Firma Franz Viegener II, Attendorn, Fed. Rep. of Germany

Filed Mar. 13, 1984, Ser. No. 589,190

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1983, 3309760

Int. Cl.⁴ A61H *33/02*

U.S. Cl. 4—544 **7 Claims**



1. A device for controlling a whirlpool bath assembly having an injector nozzle and a pneumatically actuated circulation pump, the device comprising: a housing connectable to a whirlpool tub and having a first air passage therein with an inlet and an outlet connectable to the nozzle; an air control knob having an aperture therein and mounted in the housing for rotation relative to the inlet for controlling the flow of air into the first air passage; means forming a second air outlet in the housing for connecting to the circulating pump; and pneumatic switch means mounted in the housing for applying air via the second air outlet to actuate the pump, the switch means comprising means forming a cylinder chamber in the housing in communication with the second air outlet, a piston slidably mounted in the cylinder, a disk connected to the piston and mounted over the control knob for movement toward and away from the housing to move the piston and thereby force air through the second air outlet and wherein the disk is configured to cover the aperture in the knob and to form an air gap to permit the passage of air to the aperture.

4,577,354

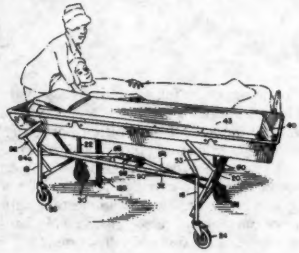
PORTABLE BATHING APPARATUS

David M. Stratton, Marquette Heights, Ill., assignor to Morton Metalcraft Company, Morton, Ill.

Filed Aug. 10, 1984, Ser. No. 639,572

Int. Cl.⁴ A47K *3/06*

U.S. Cl. 4—585 **11 Claims**



1. In a portable bathing apparatus of the type including

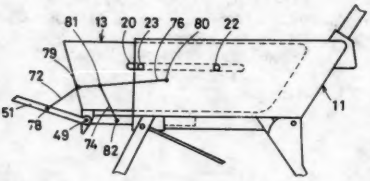
a rigid, generally horizontal support platform having a longitudinal and a lateral dimension;
support legs attached to the platform for supporting the platform above a floor;
a flexible, tub shaped, open top enclosure, having a bottom section and side sections to form the enclosure;
a generally circumferential frame for supporting the side sections of the enclosure as the bottom section is supported on the platform, said frame also having a longitudinal and a lateral dimension substantially coextensive with the corresponding platform dimensions;
the improvement comprising a frame support assembly for raising and lowering the frame and attached side sections between a raised tub enclosure configuration and a lowered collapsed position, said frame support assembly including a plurality of articulated lifting arm assemblies, each of said arm assemblies defining an intermediate pivot connection, and opposite end pivot connections, one end pivot connection of each arm assembly being attached to a leg, the opposite end pivot connection of each arm assembly being connected to the frame, each arm assembly being extensible between an unarticulated, straight position to raise the side sections and an articulated position to lower the side sections; said arm assemblies being arranged in cooperating pairs to move in unison, and transport the frame support assembly substantially vertically, at least one adjacent pair of arm assemblies being articulated to bend in opposite directions and connected by links operable to simultaneously extend the arm assemblies between the straight and articulated positions;
said arm assemblies each comprising a lower arm member and an upper arm member on the same longitudinal dimension side of the platform, and the links comprising a link from each lower arm member connected respectively with the opposite sides of an intermediate link, said intermediate link being rotatable about a point to shorten the total linkage legnth by two times the connective distance of the intermediate link, to thereby move the arm assemblies from the articulated to the straight position.

4,577,355

FRAME STRUCTURE FOR BABY CARRIAGE BED

Kenzou Kassai, Osaka, Japan, assignor to Kassai Kabushikikaisha, Osaka, Japan

Filed Aug. 1, 1984, Ser. No. 636,850
Claims priority, application Japan, Aug. 22, 1983, 58-153434; May 22, 1984, 59-104238
Int. Cl.⁴ B62B *7/06, 7/12, 9/12;* **A47D** *13/02*
U.S. Cl. 5—93 R **13 Claims**



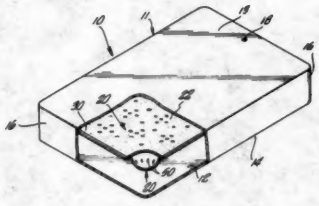
1. In a frame structure for a baby carriage bed (1), said bed having at least a bottom wall (2) and a rear wall (3), said front bottom wall (2) having a front bottom portion (6) and a rear bottom portion (7), said front bottom portion (6) being foldable with respect to said rear bottom portion (7), said frame structure enclosing said baby carriage bed (1) on both sides and supporting said baby carriage bed under said bottom wall (2), said front bottom portion (6) being movable between a horizontal position and a downwardly extending position for changing said baby carriage bed (1) between a form suitable as a bed and a form suitable as a seat, the improvement wherein said frame structure comprises a front support member (15) and rear support members (16, 17) for supporting said front bottom portion (6) and said rear bottom portion (7) of said bottom wall (2) respectively; a left side fixed member (11, 18) and a right side fixed member (12, 19) fixedly positioned on both sides of a rear portion of said baby carriage bed (1) for providing left and right side surfaces cooperating with said rear bottom portion (7), said rear support members (16, 17) being mounted across said left side fixed member (11, 18) and said right side fixed member (12, 19); a left sliding member (13, 26) and a right sliding member (14, 27) positioned on both sides of a front part of said baby carriage bed (1), and means mounting said left and right sliding members for a forward and backward sliding movement relative to said left side fixed member (11, 18) and relative to said right side fixed member (12,19) respectively for providing left and right side surfaces cooperating with said front bottom portion (6) when said front bottom portion (6) is in a horizontal position, said front support member (15) being mounted across said left sliding member (13, 26) and across said right sliding member (14, 27).

4,577,356

WATERBED MATTRESS WITH BAFFLE CHAMBERS

John B. Johenning, Los Angeles, and Charles P. Hall, Santa Rosa, both of Calif., assignors to Monterey Manufacturing Co., Carson, Calif.

Filed Apr. 1, 1982, Ser. No. 364,534
Int. Cl.⁴ A47C *27/08*
U.S. Cl. 5—450 **35 Claims**



1. In a waterbed mattress having an enclosing structure comprising a horizontally extending top wall, a horizontally extending bottom wall, and side walls, the improvement comprising a free-floating baffle structure in the enclosing structure comprising:
(a) plurality of hemi-spherodial chambers, each chamber having a planar wall and a depending wall which in double-curved, with the planar wall proximate to and substantially parallel with the top wall, and (b) at least one metering hole through the depending wall of at least a portion of the chambers for passage of water into and out of the chambers in a direction having both a horizontal component and a downward component.

4,577,357

SELF-SEALING WATERBED MATTRESS

Charles P. Hall, Santa Rosa, and Joseph Philipson, Pasadena, both of Calif., assignors to Monterey Manufacturing Co., Carson, Calif.

Filed Mar. 11, 1983, Ser. No. 474,545
The portion of the term of this patent subsequent to Sep. 3, 2002, has been disclaimed.
Int. Cl.⁴ A47C *27/08*
U.S. Cl. 5—451 **25 Claims**

1. A self-sealing waterbed mattress comprising a polymeric, puncturable envelope and an internal layer of a self-adhering, water-resistant, sealing material for sealing leaks in the envelope, the sealing material being sufficiently tacky that it adhers to the envelope and can be pulled into a puncture in the enve-

lope by the object that causes the puncture, the sealing material having a sufficiently high viscosity at 110° F. that it does not flow through a puncture in the envelope, the sealing material comprising a polyether polyurethane elastomer.

17. A method for fabricating a self-sealing waterbed mattress, the mattress comprising a polymeric puncturable envelope and an internal layer of a tacky, cured, self-adhering, water-resistant, sealing material for sealing leaks in the enve-

lope, the sealing material adhering to the envelope and having a sufficiently high viscosity at 110° F. that it does not flow through a puncture in the envelope, the method comprising the steps of:

(a) selecting first and second sheets of polymeric material;

(b) applying sealing material before it cures to the top sheet;

(c) allowing the sealing material to at least partially cure; and

(d) after step (c), heat sealing the top sheet and the bottom sheet together along their periphery to form the envelope.

4,577,358

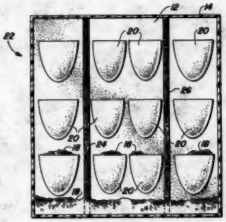
BEAN BAG BODY SUPPORT

Ted A. Glass, 3666 N. Miller Rd., Scottsdale, Ariz. 85251

Continuation of Ser. No. 619,370, Jun. 11, 1984, abandoned. This application Jul. 30, 1985, Ser. No. 760,495

Int. Cl.⁴ A47C *27/10*

U.S. Cl. 5—455 **2 Claims**



1. An improved bean bag structure, the bean bag comprising an envelope with filler material enclosed and contained therein, said filler material being free to migrate within the entire envelope, the improvement comprising:

a plurality of internal cup means for limiting migration of the filler material, each of said plurality of said internal cup means having an open end, each of said open ends of said internal cup means being oriented in a same direction.

4,577,359

METHOD OF MANUFACTURING A DRILL SCREW

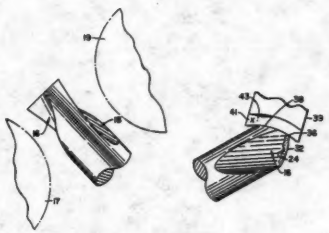
Henry A. Sygnator, Arlington Heights, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Continuation of Ser. No. 513,582, Jul. 14, 1983, Pat. No. 4,532,663, which is a division of Ser. No. 279,103, Jun. 30, 1981, Pat. No. 4,395,173. This application Apr. 24, 1985, Ser. No. 726,740

The portion of the term of this patent subsequent to Aug. 6, 2002, has been disclaimed.

Int. Cl.⁴ B23G *9/00*; B21K *1/56*

U.S. Cl. 10—10 R **5 Claims**



1. A method of manufacturing a drill screw having a pair of oppositely disposed flutes and a pair of oppositely disposed terminal end surfaces, said end surfaces intersecting to form a chisel, each end surface being bounded by a drag edge and a cutting edge, said method comprising the steps of heading a first end of a screw blank; forming two flutes in a second end of said screw blank; milling first and second terminal end surfaces on said second end, rotating peripheral teeth of a milling cutter in a direction from a drag edge of at least one of said end surfaces toward a cutting edge of said surface; leaving at least one burr positioned along outer portions of at least one of said cutting edges at a position spaced from said chisel and performing subsequent operations on said drill screw.

4,577,360

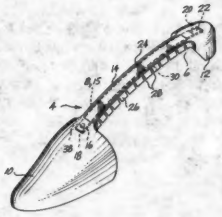
SHOE TREE

Robert D. Swenson, Seattle, Wash., assignor to Melvin D. Pountain, Everett, Wash.

Continuation-in-part of Ser. No. 653,513, Sep. 21, 1984, abandoned. This application May 15, 1985, Ser. No. 734,630

Int. Cl.⁴ A43D *5/00*

U.S. Cl. 12—115.6 **16 Claims**



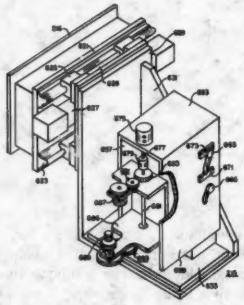
1. A shoe tree comprising a body including a toe portion, a heel portion, and a center portion connecting said toe and heel portions; and a flat spring including a main portion, and first and second opposite end portions; said center portion of the body being dimensioned to be easily grasped by a user of the shoe tree and having wall means defining a downwardly facing channel for receiving said main portion of the spring; said wall means having a plurality of slots extending therethrough and dimensioned and positioned to give said center portion a pre-

determined amount of flexibility, and means for slidably holding said main portion in position in said channel; said body having first and second engaging means for engaging said first and second end portions of the spring, respectively; and said first engaging means including means for allowing the first end portion of the spring to slide longitudinally.

4,577,361
BRUSH TOOL

Leonard P. Hornak, North Huntingdon, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 6, 1984, Ser. No. 617,851
Int. Cl.[4] A46B *13/02*
U.S. Cl. 15—21 R **12 Claims**

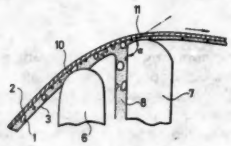


1. A brush tool for cleaning the opening in the flange of a lower guide tube of a nuclear reactor in which the split-pin assembly is secured, during the replacement of old split-pin assemblies by new split-pin assemblies, said opening having a common longitudinal axis, the said brush tool comprising an upper brush and a lower brush, means mounting said upper and lower brushes in position to be moved into brushing relationship with the upper and lower parts of the opening, but with their axes displaced with reference to each other transversely to said common axis, cam means connected to said mounting means, when actuated, for displacing said upper brush so that it is in brushing relationship with the upper part of the opening and for displacing said lower brush so that it is in brushing relationship with the lower part of the opening, means, connected to said cam means, for actuating said cam means as aforesaid, and means, connected to said brushes for operating said brushes to clean said opening.

4,577,362
APPARATUS FOR REMOVING FOREIGN MATTER FROM FLEXIBLE SUPPORT

Yasunori Tanaka, and Shinji Noda, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 17, 1984, Ser. No. 581,019
Claims priority, application Japan, Feb. 18, 1983, 58-24846
Int. Cl.[4] B08B *1/02*
U.S. Cl. 15—256.5 **9 Claims**

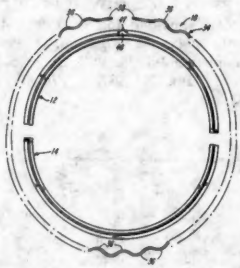


1. An apparatus for removing foreign matter from a flexible support, comprising: a supply of a solvent solution for application on said flexible support, means for applying said solvent to a flexible support to the surface of which foreign matter to be removed adheres; means for moving said support over said plates; means for tensioning said support; foreign matter and solvent removing means located downstream in the direction of movement from the applying means wherein said foreign matter and solvent are removed before the solvent evaporates, said removing means further comprising; at least two parallel adjacent plates extending widthwise perpendicular to the direction of movement of said support, each of said two plates having an edge surface which confronts said support, said surface being longer than the width of said support in the widthwise direction of said support and shorter in the direction of movement than said width of said support, at least said surface of one of said plates on the downstream side in the direction of movement of said support being sharply cut by an adjacent surface thereof to provide a cutting edge at the upstream end thereof, at least said surface of said plate provided on the downstream side in the direction of movement of said support and said support forming a gap therebetween of a size determined by the operation of said means for moving said support and said tensioning means, said gap being sufficiently small at an upstream end that said foreign matter to be removed cannot enter said gap, said gap being large enough to leave a solvent film at least 0.2 microns thick on said support after passing said plates.

4,577,363
SCRAPER RING FOR CLEANING A HYDRAULIC CYLINDER ROD OR SHAFT

Harold G. Wyse, 3629 N. Dixie Dr., P.O. Box 1431, Dayton, Ohio 45414

Filed Mar. 1, 1985, Ser. No. 707,099
Int. Cl.[4] B08B *13/00*
U.S. Cl. 15—256.5 **14 Claims**



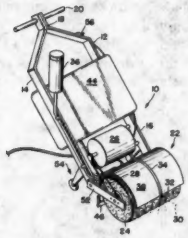
1. An improved scraper ring adapted to be mounted on a movable cylindrical shaft for scraping and cleaning the shaft, comprising a set of separate and mating part-circular ring sections fitted together to form an annular body, said body including a circumferentially extending inner surface and a side surface cooperating to form a scraping edge for cleaning foreign material from the outer cylindrical surface of the shaft, said ring sections defining an external groove extending circumferentially around said body, a resilient retaining means extending circumferentially within said groove and having opposite end portions, and means for connecting said opposite end portions of said retaining means to one of said ring sections.

4,577,364

FLOOR CLEANING MACHINE

Peter G. Demetriades, P.O. Box 1790, Henderson, N.C. 27536

Filed Jul. 6, 1984, Ser. No. 628,568
Int. Cl.[4] A47L 11/282, 11/30
U.S. Cl. 15—320 20 Claims



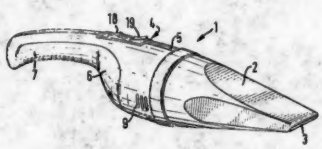
1. A floor cleaning machine comprising:
a frame having a frame lower end and a frame upper end,
a handle attached to said frame upper end,
a wheel assembly attached to said frame for supporting, at least in part, said frame on a floor,
a plurality of disc-shaped floor cleaning pads, each having an outer edge adapted to clean the floor,
a holding means for holding said floor cleaning pads longitudinally adjacent one another such that a floor pad cylinder having a longitudinal axis is formed and such that said longitudinal axis is horizontally disposed,
said outer edges together forming the circumferential floor cleaning surface of said floor pad cylinder,
a motor supported by said frame for rotating said floor cleaning pads about said horizontal longitudinal axis,
said holding means holding said floor cleaning pads so that said outer edges, when said motor rotates said floor cleaning pads, engage the floor in a vertical cleaning motion,
a spraying means supported by said frame for spraying cleaning fluid towards the floor and generally forward of said floor cleaning pads,
a fluid pick-up means supported by said frame for recovering cleaning fluid from the floor after said floor cleaning pads have been rotated on the floor by said motor, and
said fluid pick-up means including a wiping member engageable with the floor, a holding tank supported by said frame for holding the excess fluid recovered from the floor, and a suction means generally adjacent to said wiping member for sucking excess fluid to said holding tank.

4,577,365

RECHARGEABLE VACUUM CLEANER

John S. Yuen, Kwun Tong, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong

Filed Sep. 5, 1984, Ser. No. 647,454
Claims priority, application United Kingdom, Sep. 14, 1983, 8324628
Int. Cl.[4] A47L 5/24
U.S. Cl. 15—339 2 Claims



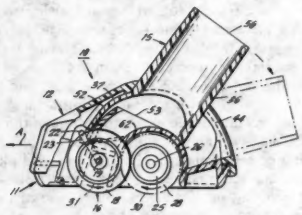
1. A rechargeable vacuum cleaner comprising a housing formed to present an intake nozzle, a body portion and a handle portion, wherein said body portion mounts a motor fan suction unit and a filter arrangement and has outlet apertures therein for air from said motor fan suction unit and said handle portion provides means for holding the rechargeable vacuum cleaner, houses a rechargeable battery and incorporates a socket whereby said battery can be connected to charging means therefore, wherein said filter arrangement comprises:
a disc of flexible filter material so mounted as completely to obstruct a passageway within said housing for air flowing from said intake nozzle to said motor fan suction unit such that all air passing through said passageway must pass through said disc of flexible filter material;
inner and outer annular members sandwiching therebetween said disc of flexible filter material, each of said two annular members includes a cylindrical wall with said cylindrical walls telescoped within each other, the inner one of said two annular members defines a grid frameword, the outer one of said two annular members is cup shaped and has slits in its said outer cylindrical wall to make said outer cylindrical wall flexible;
said disc of flexible filter material is stretched over said grid framework when said inner one of said two members is telescopically received and retained within said outer one of said two members with said disc of flexible filter material located therebetween; and
a forward part of said body portion has projecting plugs to engage within said inner cylindrical wall of said inner one of said two annular members to locate the filter arrangement on said body portion.

4,577,366

VACUUM CLEANER NOZZLE HAVING ROTATING BRUSH

Jonathan Miller, Haworth, N.J.; Robert C. Berfield, Jersey Shore, and Robert L. Crevling, Jr., Williamsport, both of Pa., assignors to Shop-Vac Corporation, Williamsport, Pa.

Filed Jun. 13, 1984, Ser. No. 620,149
Int. Cl.[4] A47L 9/04
U.S. Cl. 15—388 7 Claims



1. A nozzle assembly for a vacuum cleaner, said assembly including an inlet, outlet means at which low pressure is applied to said assembly to draw dirt particles through said inlet into and through said nozzle assembly, floor engaging first wheel means driven by movement of said nozzle assembly across a floor,
floor engaging rotatably mounted brush means and a second wheel means secured to said brush means for rotation therewith, and frictionally driven by rotation at said first wheel means said brush means, when so driven, brushing dirt particles toward said inlet; said first wheel means rotating at a speed substantially slower than the speed of rotation for the second wheel means; the first and second wheel means rotating in opposite directions on parallel axes;
a floor plate defining said inlet; said outlet means including a hollow swivel fitting pivotably connected to said floor plate and releasably connectable to a hollow handle through which low pressure is applied to said assembly;
said second wheel means being mounted for rotation on a first axis that is fixed with respect to said floor plate; said

first wheel means includes first and second wheels rotatably mounted at opposite sides of said floor plate and bodily movable with respect to said floor plate;

a cover secured to said floor plate and having first bearing means that cooperate with second bearing means on said floor plate to pivotably support and retain said swivel fitting;

said swivel fitting including a hollow neck having one end releasably connectable to a hollow handle, said cover including a slot within which said neck moves as said swivel fitting pivots about a swivel axis defined by said first and second bearing means, said neck extending transverse to said swivel axis.

4,577,367

DETACHABLE HANDLE INCLUDING A SPRING-BIASED PIVOTING LOCKING MEMBER

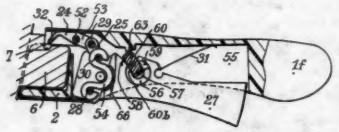
Philippe Durand, Arques, France, assignor to Verrerie Cristallerie d'Arques J. G. Durand & Cie., Arques, France

Filed Feb. 27, 1984, Ser. No. 584,243

Claims priority, application France, Feb. 28, 1983, 83 03235; Sep. 28, 1983, 83 15398

Int. Cl.⁴ B25G *3/18*

U.S. Cl. 16—114 A **10 Claims**



1. A device for fitting a removable handle to the body of a kitchen utensil having an upper edge, comprising an end piece formed on the lateral wall of the body of the utensil and having an upper face, a housing provided in the connecting end of the handle and in which said end piece can be inserted with a loose fit, and a locking device mounted in said housing and comprising a pivoting piece and means for causing said pivoting piece to pivot, the upper face of the end piece having a notch, said pivoting piece having an end curved in the shape of a nose for insertion in the notch of the end piece, and said means for causing said pivoting piece to pivot being arranged so as to selectively bring said curved end into or out of the notch and so as to lock the pivoting piece in this position or to unlock it, during fitting or removal of the handle, said end piece, in the locking position, being subjected to a compression force between said pivoting piece and the lower face of the housing provided in the connecting end of the handle, wherein said pivoting piece is a first link in the form of a pawl situated at one end of an assembly of links constituting a toggle joint, said locking means are formed by the other links of said assembly, one of these links being incorporated in a trigger serving as a locking lever and biased outwardly of the handle under the action of a return spring, so that when said trigger is pushed inwardly of the handle it brings said other links of the toggle joint into a bracing relation to said first link, and an unlocking push button is provided which, when it is pushed, exerts a pressure on the locking lever outwardly of the handle, which breaks the bracing effect of said other links of the toggle joint.

4,577,368

APPARATUS FOR CUTTING APART POULTRY WINGS

Jacobus E. Hazenbroek, Burg de Zeeuwstratt 52, Numansdorp, Netherlands

Filed Aug. 27, 1984, Ser. No. 644,514

Int. Cl.⁴ A22C *21/00*

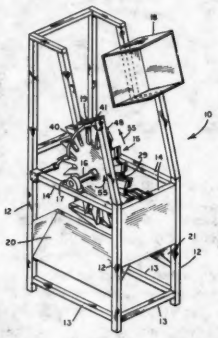
U.S. Cl. 17—11 **8 Claims**

1. Apparatus for cutting poultry wings having an elbow joint joining a drumette with a middle section and a flipper joint joining the middle section with a flipper, and with said apparatus comprising a wheel mounted for rotary movement with the wheel periphery having a plurality of circumferentially spaced troughs each formed with an axially spaced ridge and valley, and at least two annular slots formed in said wheel periphery with one slot passing through the trough ridges and the other slot passing through the trough valleys:

a first cutting blade positioned within said one slot;

a second cutting blade positioned within said other slot;

a first guide bar mounted to one side of said one slot and the path of travel of said trough ridges, and a second guide bar mounted on the other side of the path of travel of said one slot and in said other slot and over the path of travel of



said trough valleys, whereby the first and second guide bars first guide the elbow joint of a wing positioned in a trough into cutting engagement with the first cutting blade by simultaneous sliding contact with the drumette and middle section, respectively, so that the drumette is cut away from the middle section of the wing by the first cutting blade, and then after the drumette has been cut away from the middle section of the wing the second guide bar engages the back of the flipper joint and guides the front of the flipper joint into cutting engagement with the second cutting blade by sliding contact with the back of the flipper joint.

4,577,369

DE-BONING MACHINE

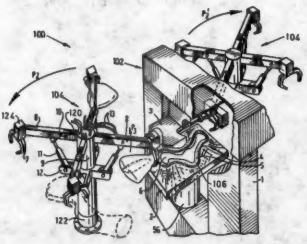
Christianus P. Langen, Cuyk, and Johannes C. Langen, Cuyk N.B., both of Netherlands, assignors to Langen Research B.V., Cuyk, Netherlands

Filed Jan. 31, 1983, Ser. No. 462,395

Claims priority, application Netherlands, Feb. 8, 1982, 8200469; Mar. 19, 1982, 8201159; Aug. 2, 1982, 8203078

Int. Cl.⁴ A22C *17/04*

U.S. Cl. 17—46 **24 Claims**



1. A device for de-boning boned pieces of meat having a bone structure which includes relatively flat bone portions such as shoulder pieces, comprising by a frame, a first die

arranged in the frame and having a continuous cutting edge projecting therefrom which extends about the perimeter of an enclosure which has a shape substantially matching and slightly larger than the shape of the bone in the piece of meat, a second die arranged in said frame opposite the first die element and driving means for moving the first die element and the second die away from and towards one another to bring the cutting edge into a cutting engagement with the second die along a cutting line spaced outwardly from the bone of the boned pieces of meat which is to be de-boned and a clamping member for clamping said flat bone portion, said clamping member being mounted for movement toward and away from said first and second dies to remove the flat bone from the meat in response to movement of the clamp away from the dies.

4,577,370

METHOD AND APPARATUS FOR OPENING AXIALLY SHIRRING AND DIVIDING OFF THIN-WALLED, CORD-SHAPED TUBULAR CASING MATERIAL, ESPECIALLY CASINGS MADE OF SYNTHETIC MATERIAL, FOR THE SAUSAGE MANUFACTURE

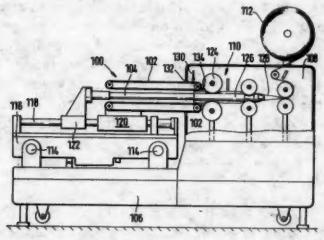
Günter Kollross, Am Wallerstädter Weg 20, D-6080 Gross Gerau-Dornheim, Fed. Rep. of Germany

Filed Nov. 22, 1983, Ser. No. 554,240

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1982, 3244085

Int. Cl.[4] A22C *11/02*

U.S. Cl. 17—49 **18 Claims**



1. A method for producing link sausages using tubular casing material which is wound on a reel in a flat condition, the method comprising;

unwinding a predetermined length of casing material from said reel,

opening said predetermined length of casing material to a tubular cross section,

moving a first point near the forward end of said tubular casing material into gripping engagement with a first gripping means,

synchroneously moving the first gripping means and the forward end of said predetermined length of tubular material for a predetermined distance,

gripping the tubular casing material by a second gripping means at a spaced point spaced by said predetermined distance from the first point, which predetermined distance corresponds to the distance which the tubular casing material and said first gripping means have moved,

moving the second gripping means together with the tubular casing means in the same direction but with a reduced speed relative to the unwinding speed of the casing material to axially shir the casing material to form a shirred length of tubular casing material having circumferential folds, with the portion of said casing material situated between said first point and said spaced point remaining unshirred,

cutting off said shirred length of tubular casing material from the remainder of the casing material,

laterally moving said shirred length of tubular casing material into a position ahead of the charging tube of a sausage filling machine and positioning said shirred length onto said charging tube, and

filling and closing said tubular casing material on said charging tube with sausage meat.

4. An apparatus for producing link sausages using tubular casing material which is wound on a reel in a flat condition, comprising:

means for feeding the wound casing material and for opening the casing material to a tubular cross-section,

a receiving means for receiving the tubular casing material,

said receiving means including a first gripping means for gripping a point near the forward end of the tubular casing material,

said receiving means including a means for synchronously moving the first gripping means and the said forward end for a predetermined distance,

said receiving means further including a second gripping means for gripping the tubular casing material at a spaced point spaced by said predetermined distance from the first point, which predetermined distance corresponds to the distance which the tubular casing material and said first gripping means have moved since the first gripping means grip the tubular casing material,

said receiving means having means for moving the second gripping means together with the tubular casing material in the same direction but with a reduced speed relative to the feeding means to thus axially shir the casing material to form a shirred length thereof which has circumferential folds, leaving the portion of said casing material between said first point and said spaced point unshirred,

cutting means for cutting off said shirred length of tubular casing material from the remainder of the casing material,

means for laterally moving the shirred length of tubular casing material to a position ahead of a charging tube of a sausage filling machine and means for positioning said shirred length onto said charging tube, thereby positioning said shirred length to be filled with sausage meat, and

means for closing the forward end of the shirred length prior to filling.

4,577,371

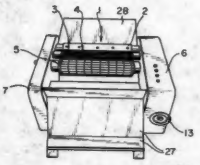
MACHINE FOR PEELING, SKIMMING, SKINNING AND/OR SLICING JOINTS OF MEAT, FISHES AND THE LIKE

Gilbert Simon, 475, rue Caroline, app. 20, Longueuil, Quebec, Canada J4H 3L7

Filed Dec. 19, 1984, Ser. No. 683,467

Int. Cl.[4] A22C *25/17*

U.S. Cl. 17—62 **10 Claims**



1. A machine for peeling, skimming, skinning or slicing a cut of meat or fish, of the type comprising:

a cutting blade;

a drive roller mounted in cooperative relationship with respect of the blade for pushing towards said blade the cut of meat or fish to be peeled, skimmed, skinned or sliced, and

means for cleaning the roller;

said machine being characterized in that it further comprises:

a central compartment in which are transversally mounted the blade, the drive roller and said means for cleaning the roller, said blade being mounted on a pivotable blade-sup-

port, said cleaning means comprising a comb in contact with said roller;

a pair of lateral compartments located on both sides of the central compartment, said lateral compartments being tight and containing means for driving the roller and means for controlling the operation of the machine from the outside, one of said lateral compartment also containing a control member for adjusting the position of the pivotable blade support;

said blade support being mounted in the central compartment in such a manner that the upper surface of the drive roller is always located at a level slightly higher than the level of the blade to make the machine safer in use;

said machine further comprising a cylindrical container in which are tightly and removably mounted an electrical motor operatively connected to said driving means, and other electrical components necessary for operating the machine, said cylindrical container rigidly extending accross the central compartment between said lateral compartments.

4,577,372

DRAWING FRAME

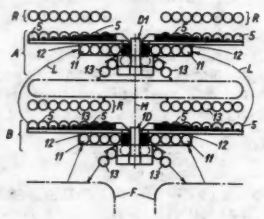
Kurt Roder, Seuzach, Switzerland, assignor to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed Jun. 20, 1984, Ser. No. 622,625

Claims priority, application Switzerland, Jun. 21, 1983, 3382/83

Int. Cl.⁴ D01H *5/00*

U.S. Cl. 19—159 A **3 Claims**



1. In combination,

at least a pair of drawing frames disposed in spaced sequential relation to define a passageway therebetween,

each said drawing frame having at least one sliver infeed table for receiving and guiding a plurality of slivers in a first direction, a first magazine for receiving a first row of sliver-containing cans at said infeed table, a sliver infeed means for feeding slivers from said infeed table in a second direction perpendicular to said first direction, means to divert the slivers from said first direction to said second direction, and a second magazine for receiving a second row of empty cans in parallel relation to said first row and perpendicular to said infeed means;

said rows of cans of one drawing frame being parallel to said rows of cans of the other drawing frame; and

means for conveying a third row of sliver-filled cans from said one drawing frame into a reserve row adjacent said first row of sliver-containing cans of said other drawing frame.

4,577,373

BUTTON COLLET

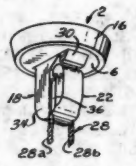
E. Dan Bush, Downers Grove, Ill., assignor to Handy Button Machine Company, Melrose Park, Ill.

Filed Nov. 8, 1984, Ser. No. 669,472

Int. Cl.⁴ A47C *27/00*

U.S. Cl. 24—90 B **9 Claims**

1. A button collet for a tufting button in combination with an attached tufting loop, said button collet having a resilient plastic body with a central axis, a base, a peripheral side surrounding said axis and joined to said base, and a structure projecting from said base, said stucture comprising a stem having a shank having opposite side faces and an opposed hook separated from said shank by a gap at the free end of the hook, said shank and hook defining a recess having a bottom portion for receiving and retaining the tufting loop, said loop having segments on opposite sides of said structure and lying adjacent to said structure when tensile force is applied to said loop in a general direction away from said base, thereby to apply forces to said hook tending to rotate the hook in a direction that widens said gap and increases the tensile stress on said structure, characterized by an improvement comprising a shoulder



formed on each of said opposite side faces and with each shoulder extending from adjacent said bottom portion to an outer edge of said shank, each said shoulder being adjacent to one of said tufting loop segments and in pressure engagement therewith, said side faces shaped to provide unobstructed engagement of said segments with said shoulders, when said tensile force is applied to said tufting loop and with the shoulders being dimensioned and shaped to retain said segments thereon when said tensile force is applied thereby to produce components of forces in said segments including a component normal to each shoulder, said normal components of force tending to rotate said hook in a counter direction that reduces said gap and said tensile stress.

4,577,374

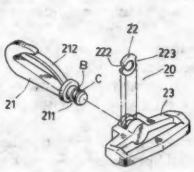
SNAP HOOK AND BUCKLE

Huei J. Lii, No. 8, Lane 46, Chung Teh Pa St., Tainan, Taiwan

Filed Dec. 4, 1984, Ser. No. 677,805

Int. Cl.⁴ A44B *11/00*

U.S. Cl. 24—165 **1 Claim**



1. An elastic buckle construction comprising:

a base having a bore at its top end and a throughhole transversely passing from one side to another side of the bore;

an engaging ring having a cut on its one side, a recess on its other side, and a tapered annular wall surface at its inner side, the engaging ring being received in the throughhole of the base; and

a buckle body having, at its bottom side, an engaging rod which is contracted at its upper portion and is enlarged at it lower portion and which has a tapered end to facilitate the insertion of the engaging rod into the bore;

whereby, when the engaging rod of the buckle body is inserted in the bore and its contracted portion is clamped by the engaging ring, the base and the buckle body can be coupled into a buckle.

4,577,375

QUICK ATTACHMENT DEVICE FOR HARNESS OF A PIECE OF EQUIPMENT

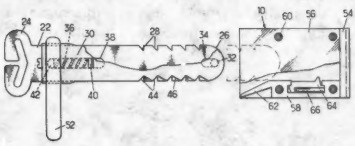
Raymond Beaussant, Bretigny, France, assignor to Intertechnique, Plaisir, France

Filed Aug. 30, 1984, Ser. No. 645,779

Claims priority, application France, Aug. 31, 1983, 83 13974

Int. Cl.[4] A41F *1/00*; A44B *11/25*

U.S. Cl. 24—580 9 Claims



1. A quick attachment device for the harness of a piece of equipment, comprising a receiving member adapted to receive a bayonet member rigidly connected to the harness, the bayonet member cooperating with the receiver member via locking means which can be retracted by pulling on a control plate borne by the bayonet member and can slide thereon from an abutment position into which it is resiliently urged, wherein said bayonet member is formed by a solid blade having a pair of longitudinal edges formed with respective racks engaging with retractable locking fingers borne by the receiver member, and the control plate comprises two sets each of a plurality of notches distributed along said plate with the same pitch as the racks and whose profile is such that they displace the fingers out of the racks when the control plate is pulled, in the direction corresponding to the withdrawal of the bayonet member, from an abutment position into which said control plate is resiliently urged.

4,577,376

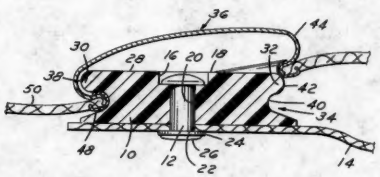
SNAP FASTENER

Charles D. Clendinen, 152 Lodewyck, Mount Clemens, Mich. 48043

Continuation-in-part of Ser. No. 340,204, Jan. 1, 1982, Pat. No. 4,409,706, which is a continuation-in-part of Ser. No. 255,370, Apr. 20, 1981, abandoned, and a continuation-in-part of Ser. No. 340,203, Jan. 18, 1982. This application Aug. 10, 1983, Ser. No. 522,056

Int. Cl.[4] A44B *17/00*

U.S. Cl. 24—624 5 Claims



1. A snap fastener comprising, in combination:

a stud intended to upstand at one end from a member to be fastened;

receiver seats disposed on opposite sides of the stud;

a latching shoulder on the stud above one of the seats;

a retaining lobe on the stud above the other seat;

said stud, including the latching shoulder and retaining lobe having a continuous peripheral surface;

a receiver intended to association with a member to be fastened to the first mentioned member and having an aperture with a continuous internal surface dimensioned to allow telescoping over the stud for nesting in said seats;

said internal dimension of the receiver being sufficiently less than the dimension of the stud, measured from the apex of said shoulder to the seat on the opposite side of the stud, to provide an interference fit permitting the receiver to pass the shoulder while nested in such seat at the opposite side of the stud and upon the elastic deformation of the stud and/or receiver; and

wherein the stud head extends circumaxially around the stud at a substantially uniform distance from a first axis, and said receiver seats comprise portions of a groove at opposite sides of the stud which groove extends circumaxially around the stud at a substantially uniform distance from a second axis, and said axes are laterally displaced from each other.

4,577,377

BUCKLE FOR STRAPS

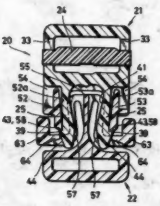
Kazumi Kasai, Namerikawa, Japan, assignor to Nippon Notion Kogyo Co., Ltd., Tokyo, Japan

Filed May 11, 1984, Ser. No. 609,426

Claims priority, application Japan, May 13, 1983, 58-71465[U]

Int. Cl.[4] A44B *11/25*

U.S. Cl. 24—625 11 Claims



1. A buckle for fastening strap end portions comprising:

(a) a male member including a first connector frame connectable to one of the strap end portions, and a pair of resiliently flexible legs extending from said first connector frame in a common direction, each said leg having an abutment surface having toward said first connector frame; and

(b) a female member having a second connector frame connectable to the other strap end portion, and a socket portion joined with said second connector frame and releasably couplable with said legs, said socket portion including

(1) a plate extending from said second connector frame and a pair of spaced sidewalls disposed on one surface of said plate and extending longitudinally of said plate so as to define therebetween a slot for receiving therein said legs, each of said sidewalls having a retaining surface facing toward said second connector frame and respectively engageable with said abutment surfaces of said legs to interlock said male and female members,

(2) a pair of cantilevered arms disposed inwardly of said sidewalls and resiliently flexible toward and away from said sidewalls, each said arm having a distal end disposed outside of said slot and an actuating lug disposed on said distal end and engageable with one of said legs, said arms being resiliently flexible toward each other to cause said actuating lugs to urge said legs to flex resiliently toward each other for bringing said abutment surface and said retaining surface out of engagement with one another, and

(3) a central partition wall disposed on said surface of said plate and spaced equidistantly from said sidewalls to separate said slot into two slot portions for receiving therein said legs, respectively, said arms being con-

nected to said partition wall, one on each side of said partition wall.

4,577,378

BUCKLE FOR SAFETY BELTS

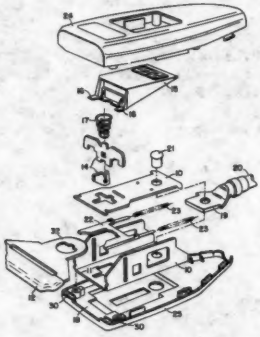
Holger Harenberg, Rellingen, Fed. Rep. of Germany, assignor to Autoflug GmbH, Rellingen, Fed. Rep. of Germany

Filed Jun. 21, 1984, Ser. No. 623,175

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1983, 3322164

Int. Cl.[4] A44B *11/26*

U.S. Cl. 24—635 28 Claims



1. A buckle for safety belts in passenger carrying vehicles; the buckle includes a housing means, and a tongue which is adapted to be connected to a belt and can be inserted into an insertion opening of said housing means and into a path therein for said tongue; said tongue can be locked in said housing means by at least one latching member, and is acted upon by a spring-loaded ejector; the improvement comprises;

at least one spring element disposed in said housing means in the vicinity of said insertion opening for said buckle tongue; each of said spring elements has at least one abutment surface which projects laterally into said path which said tongue must traverse upon its insertion into said housing means; said at least one abutment surface of each of said spring elements projects laterally into said path in such a way that a tongue present therein is acted upon transverse to its direction of insertion or ejection;

each of said spring element having an approximately S-shape including an S-path therewith, with the S-path being disposed in or parallel to the plane of said buckle tongue; each spring element having an outer S-curve which is closest to said insertion opening of said housing means; said outer S-curve acting upon the affected sides of said buckle tongue with respective force components counter to and transverse to the direction of insertion.

4,577,379

BEARING ASSEMBLY AND METHOD FOR ASSEMBLING A BEARING

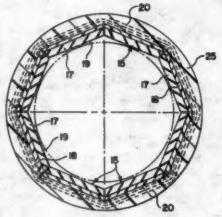
James H. Kramer, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 525,521, Aug. 22, 1983, Pat. No. 4,473,308. This application Jul. 20, 1984, Ser. No. 632,915

Int. Cl.[4] B21D *53/10;* B31C *13/00;* B65H *81/00;* B32B *1/00*

U.S. Cl. 29—149.5 S 9 Claims

1. The method of making a bearing assembly having removable staves comprising the steps of building a flat rectangular layer of elastomeric material; vulcanizing said layer of elastomeric material; cutting said layer of elastomeric material into a plurality of strips; bonding each of said strips of elastomeric material to respective strips of ultra-high molecular weight material to form a plurality of individual bearing staves with trapezoidal cross sectional shape having an upper and lower flat surface; locating said staves onto a polygonal shaped mandrel with said layers of elastomeric material located radially inwardly to form a circumferential hoop whose outer peripheral surfaces defines a polygon bounded by straight sides; rotating said mandrel while wrapping a fiber fabric onto the outer periphery of said circumferentially spaced staves and impregnating said fiber fabric with a plastic resin; curing said resin to complete a fiber reinforced plastic outer shell having an inner periphery that is polygonal in contour which is non-adherent to said axially removable staves; and securing a pair of spaced annular rings to said outer shell to retain said staves in said shell.



7. The method of making a bearing assembly comprising the steps of supplying a plurality of bearing staves that are trapezoidal in cross section with an outer flat layer of ultra-high molecular weight material and an inner flat layer of elastomeric material; securing said staves on a mandrel with said layers of elastomeric material contacting said mandrel defining a polygonal bearing surface; wrapping a fiber fabric onto the outer periphery of said staves and impregnating said fiber fabric with a plastic resin; curing said resin to form a fiber reinforced outer shell having an inner polygonal shaped contour; and retaining said staves in said outer shell by securing annular rings to said shell which abuttingly engage said staves.

4,577,380

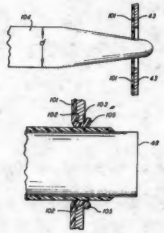
METHOD OF MANUFACTURING HEAT EXCHANGERS

Donald F. Warner, Latham, N.Y., assignor to Heat Exchanger Industries, Inc., Latham, N.Y.

Division of Ser. No. 406,774, Aug. 10, 1982, Pat. No. 4,487,139, which is a continuation-in-part of Ser. No. 252,297, Apr. 9, 1981, abandoned, which is a continuation-in-part of Ser. No. 81,789, Oct. 4, 1979, abandoned. This application Nov. 14, 1984, Ser. No. 671,494

Int. Cl.[4] B21D *53/08;* B23P *15/26;* F28F *9/04;* B29C *51/00*

U.S. Cl. 29—157.3 C 6 Claims



1. The method of fabricating a heat exchanger which comprises the steps of: heat-forming edge portions of holes in a plastic sheet having a plurality of holes to extend through and line holes in an adjacent metal sheet having holes which register with respective holes in said plastic sheet; inserting respective plug means in each plastic-lined hole before the plastic

lining of the hole has cooled to limit diametrical reduction of the plastic-lined holes; removing said plug means from said holes; and entering the end of a respective tube through each plastic-lined hole sufficiently soon after removal of the plug means from the hole that the progressive diametrical reduction of the plastic-lined holes allows said end to be entered through said plastic-lined hole but then causes the plastic-lined hole to grip and fixedly locate said tube relative to said metal sheet.

4,577,381

BOILING HEAT TRANSFER PIPES

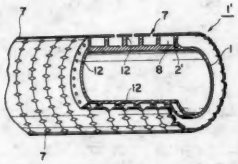
Yoshiyuki Sato; Akio Isozaki; Tomio Higo, and Tetsuo Uchida, all of Kanagawa, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Feb. 6, 1984, Ser. No. 577,504

Claims priority, application Japan, Apr. 1, 1983, 58-58333; Apr. 26, 1983, 58-74351

Int. Cl.⁴ B23P *15/26*

U.S. Cl. 29—157.4 **2 Claims**



1. A method for producing a boiling heat transfer pipe having in the outer circumferential wall thereof a helical cavity the turns of which are separated by a helical fin, said helical cavity having a ceiling through which a plurality of openings lead from said helical cavity to the exterior of said boiling heat transfer pipe and said helical fin having a plurality of holes therethrough leading from one turn of said helical cavity to the next adjacent turn of saids helical cavity, said method comprising the steps of:

(a) pressing a set of rotating groove-rolling discs of gradually increasing diameter against the outer circumferential surface of a blank pipe to form a helical groove separated by a helical fin extending around the outer circumferential surface of said pipe; then

(b) pressing a rotating notching gear against the outer surface of said helical fin so as to cut notches in the outer surface of said helical fin which extend from one turn of said helical groove to the next adjacent turn of said helical groove, each of said notches comprising a first, V-shaped portion tapering from a first width at the outer circumferential surface of said pipe to a second, narrower width radially inwardly from the outer circumferential surface of said pipe and a second, slit portion extending radially inwardly from the bottom of the first portion; then

(c) pressing a set of rotating splitting roller discs with splitting edges of gradually increasing angle into the outer surface of said helical fin so as to split and spread apart the outer portion of said helical fin, said rotating splitting roller discs extending into said pipe to the level of the top of the second portion of said notches and serving to deform said pipe so as to seal off the tops of the second portions of said notches; and then

(d) pressing a rotating press roller against the split outer surface of said helical fin so as to form flat side wings on each side of said helical fin which abut against the flat side wings on the adjacent turns of said helical fin to form a ceiling covering said helical groove and converting said helical groove into a helical cavity, the first, V-shaped portion of said notches cut in said helical fin by said rotating notch gear serving as openings leading from said helical cavity to the exterior of said boiling heat transfer pipe and the second, slit portions of said notches serving as holes leading through said helical fin from one turn of said helical cavity to the next adjacent turn of said helical cavity, whereby migration of the boiling liquid takes place both outwardly through said openings and axially through said holes.

4,577,382

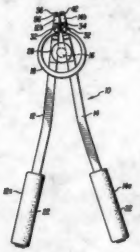
SNAP RING TOOL

David E. Weglage, Trotwood, Ohio, assignor to Harold K. McIntire, Xenia, Ohio, a part interest

Continuation of Ser. No. 602,085, Apr. 18, 1984, abandoned, which is a continuation of Ser. No. 300,126, Sep. 8, 1981, abandoned. This application Jan. 11, 1983, Ser. No. 690,827

Int. Cl.⁴ B23P *19/04*

U.S. Cl. 29—229 **8 Claims**



1. In a snap ring tool of the type comprising a pliers-like implement having at least two hand-grip members, at least first and second jaw members, and means for interconnecting said hand-grip members with said jaw members to cause said jaw members to separate when said hand-grip members are urged toward one another, each of said jaw members including snap-ring engaging means for respectively engaging a snap ring on opposite sides of a break in said snap ring to force said opposite sides apart and thereby expand said snap ring,

the improvement wherein said snap-ring engaging means of said first jaw member comprises projection means for extending along a projection axis into a snap-ring hole on a first side of the break in said snap ring, and said snap-ring engaging means of said second jaw member comprises means defining a slot having two opposite sidewall surfaces and an inside-wall surface, said two opposite sidewall surfaces lying substantially in planes transverse to said projection axis and said inside-wall surface being formed by a wall adjacent said projection axis, said slot having an open side in the direction facing laterally away from said projection axis in which the edge of said snap ring at said break can be inserted with a break edge surface of said snap ring on the second side of the break contacting said inside-wall surface of said slot and the two opposite sidewall surfaces of said slot being positioned on opposite sides of said snap ring for preventing swiveling thereof, whereby, when both of said snap-ring engaging means are engaged with said snap ring, said hand-grip members can be squeezed together to cause said jaw members to separate, thereby forcing the sides of said snap ring apart, while said tool holds said snap ring in a substantially planar configuration.

4,577,383

WELDING JIG

Robert S. Beesley, P.O. Box 152, Cleveland, Utah 84518, and Joe Feichko, 432 E. Sunset Rd., Henderson, Nev. 89015

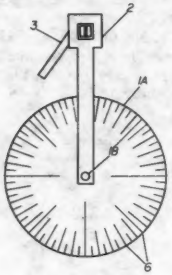
Filed Sep. 4, 1984, Ser. No. 606,934

Int. Cl.⁴ B25B *27/14*

U.S. Cl. 29—281.1 **5 Claims**

1. A welding jig for locating bored bit tool blocks on the

surface of a rotatable cutting head of a mining machine, said jig comprising a pair of assemblies each of which assemblies includes means for securing the same to one end of said rotatable drum head and having a lever rotatable about the axis of said drum said lever extending beyond the surface of said drum; a rigid bar secured to and extending between said levers parallel



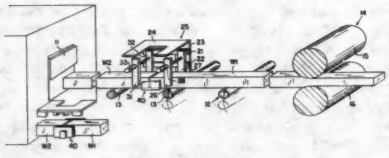
to the axis of said drum and at a location above the surface of said drum, at least one bit block holder adapted to hold bit blocks which are bored to accept cutting bits, means for mounting said bit block holder on said rigid bar to be non-rotational but slideable thereon, and means on said bit block holder for receiving and guiding bit blocks toward the surface of said drum.

4,577,384

METHOD FOR JOINING TOGETHER HEATED WORKPIECES FOR PROCESSING IN A ROLLING MILL

Francis H. Bricmont, 905 Bridgewater Dr., Pittsburgh, Pa. 15206

Filed Apr. 27, 1984, Ser. No. 604,901
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29—460 12 Claims



1. A method for joining together heated workpieces for processing in a rolling mill, said method including the steps of:

moving the leading end of a second heated workpiece in closely-spaced relation with a trailing end of a first heated workpiece on a conveyor,

maintaining a predetermined gap between the leading end of the second workpiece and the trailing end of the first workpiece while the first and second workpieces are continually advanced by said conveyor,

arranging a mold to span and seal said predetermined gap by surrounding peripheral end portions of said first and second workpieces,

feeding liquid-weld metal to said mold to essentially only fill said predetermined gap with the liquid-weld metal,

joining the first and second heated workpieces together by allowing the liquid-weld metal to at least partially solidify, and

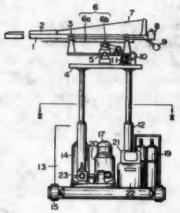
removing the mold from the workpieces.

4,577,385

METHOD AND APPARATUS FOR REPAIRING A WALL OF COKE OVEN

Yoshihiro Omae; Kunio Ishikawa; Takahisa Fukao, and Katsushige Yoshida, all of Kitakyushu, Japan, assignors to Mitsubishi Chemical Industries, Ltd., Tokyo, Japan

Filed May 20, 1983, Ser. No. 496,511
Claims priority, application Japan, May 27, 1982, 57-88895
Int. Cl.[4] B67D *5/08;* B23K *9/04;* B22D *19/10;* B23P *7/00*
U.S. Cl. 29—402.18 14 Claims



1. A method of repairing damages on a wall of an enclosed chamber in which a fuel is burned to provide heat, which comprises the steps of:

inserting a lance into the inside of the enclosed chamber from a front of the enclosed chamber, said lance being provided with at least an optical system having means for introducing light into said chamber, as well as means for reflecting, focussing and transmitting an image on the wall so as to permit observation at a position outside of the enclosed chamber, and a nozzle for spraying materials adapted for use in repairing the damages on the wall;

detecting the damages on the wall by moving the lance and means for introducing light horizontally and vertically within the enclosed chamber along the wall so as to direct light at damaged areas while observing the image on the wall through the optical system at the outside of the enclosed chamber; and

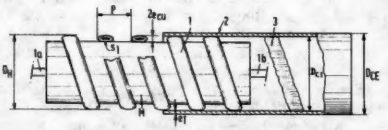
spraying repairing materials onto damaged area detected on the wall from the nozzle.

4,577,386

METHOD FOR MANUFACTURING A SLEEVE, IN PARTICULAR FOR A CONTAINER FOR STORING A CRYOGENIC FLUID

Jean-Yves Faudou, Villecresnes, and Pierre Pelloux-Gervais, Seyssins, both of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Jun. 25, 1984, Ser. No. 625,175
Claims priority, application France, Jun. 24, 1983, 83 10473
Int. Cl.[4] B21D *39/00;* B23P *17/00*
U.S. Cl. 29—455 R 13 Claims



1. A method for manufacturing a sleeve of sheet metal, in particular for a container for storing a cryogenic fluid, comprising a tank disposed in said sleeve and spaced from said sleeve by an interwall space containing a vacuum, and at least one coiled heating tube placed in said interwall space, said method comprising:

winding on a radially expansible mandrel at least one metal

tube having a flattened cross-sectional shape so as to produce a helical structure having a pitch p and an outside diameter D_H;

mounting on the mandrel and the tube a sheet metal cylinder which has a circular cross-sectional shape and an inside diameter $D_{CI}=D_H+\epsilon$ so that the cylinder is a slide fit on said tube;

applying the tube against the wall of the cylinder by expanding the mandrel, and

injecting into the flattened tube a fluid, in particular a hydraulic fluid, at a sufficient pressure to cause the tube to assume, by expansion, the shape of a coiled tube having a circular cross-sectional shape and thereby locally deform the wall of the cylinder in the shape of a helical impression.

4,577,387

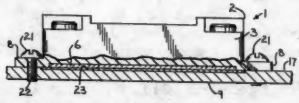
METHOD OF MOUNTING A COMPACT CIRCUIT PACKAGE TO A HEAT SINK OR THE LIKE

Lance R. Kaufman, 131 N. White Oak Way, Mequon, Wis. 53092

Division of Ser. No. 546,999, Oct. 31, 1983, Pat. No. 4,546,411. This application Feb. 15, 1985, Ser. No. 702,147

Int. Cl.⁴ B23P *25/00*

U.S. Cl. 29—458 **4 Claims**



1. A method of mounting a compact circuit package containing heat generating electrical components to the wall of a heat sink, and wherein said package includes a housing having a heat conducting substrate and with a bubble of film overlying said substrate and adhesively secured to said housing peripherally of said substrate and forming an enclosed grease containing chamber, said method comprising the steps of:

(a) applying external pressure to the outer side of said film to spread a layer of said grease onto said substrate within said chamber,

(b) removing said film from said housing so that said layer of grease on said substrate is exposed,

(c) and securing said compact circuit package to the wall of said heat sink so that said layer of grease is interposed therebetween.

4,577,388

METHOD OF CUTTING APERTURES IN LINING IN UNDERGROUND PIPES

Eric Wood, Willingborough, England, assignor to Insituform Intl Inc, Channel Islands

Continuation of Ser. No. 346,866, Feb. 8, 1982, abandoned. This application Nov. 9, 1984, Ser. No. 669,780

Claims priority, application United Kingdom, Feb. 6, 1981, 8103660

Int. Cl.⁴ B23P *17/00*; B23C *3/02*; E03F *3/06*

U.S. Cl. 29—558 **2 Claims**

1. A method of re-establishing a side connection in a pipeline or passageway which has been lined with a lining which covers the side connection, the method comprising the steps of

(a) introducing a cutter unit into the interior of the pipeline or passageway prior to the lining operation and moving it along the interior of said pipeline or passageway until it arraives at said side connection,

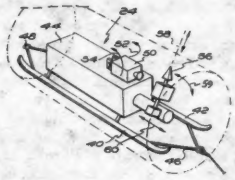
(b) recording the position of the cutter unit in a computer,

(c) withdrawing the cutter unit from the pipeline or passageway,

(d) lining the pipeline or passageway with a lining which covers the side connection,

(e) reintroducing said cutter unit into the interior of said pipeline or passageway,

(f) moving said cutter unit along said pipeline or passageway,



(g) stopping the movement of said cutter unit when it arrives at said side connection in accordance with the information derived from step (b), and

(h) activating a cutter device on said cutter unit so that the cutter device will cut through said lining and establish an opening therethrough to said side connection.

4,577,389

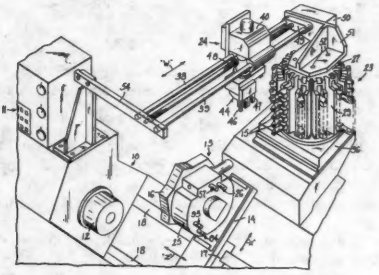
AUTOMATIC TOOL CHANGER

Walter Shultz, Newport, N.H., assignor to Textron, Inc., Providence, R.I.

Filed Apr. 19, 1983, Ser. No. 486,419

Int. Cl.⁴ B23Q *3/155*

U.S. Cl. 29—568 **3 Claims**



1. A system for mounting a tool on a turret or tool block, comprising:

automatic control means;

a turret or tool block having a base portion and a tool clamping unit with securing means actuatable for engaging a tool deposited within the clamping unit, wherein said turret has a selectively indexable face plate member, said face plate member having a plurality of tool holders each provided with a discrete securing means with a leverarm actuating member, said base portion having an internal cavity;

actuator means mounted on said turret or tool block and being responsive to said automatic control means and actuator means within said base portion and responsive to manual manipulation, each said actuator means including at least one hydraulic cylinder having a piston, which initiates actuations of said securing means, wherein said actuator means includes a hydraulic cylinder having a piston extendable within said internal cavity, a split collar positioned within said internal cavity and having a generally central alcove for clampingly receiving a portion of said piston and said collar being coincidentally translatable with said piston, an intermediate shaft extending from a portion of said split collar distal from the central alcove and having an abutment end portion extendable without

said portion upon actuation of said hydraulic cylinder, a plurality of actuator pins each slidably mounted within a portion of the face plate member and having a first end engageable with a respective one of said leverarm actuating members and a second end being selectively engageable by the abutment end portion of said intermediate shaft in response to selective indexing of said face plate member and actuation of said hydraulic cylinder;

a tool storage and feeder mechanism for selectively presenting a tool at a predetermined storage location in response to said automatic control means; and

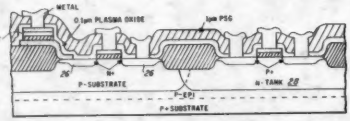
a tool manipulating and transporting means responsive to said automatic control means for obtaining the selected tool from said tool storage and feeder mechanism at said predetermined storage location and for positioning the selected tool within said tool clamping unit.

4,577,390

FABRICATION OF POLYSILICON TO POLYSILICON CAPACITORS WITH A COMPOSITE DIELECTRIC LAYER

Roger A. Haken, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 23, 1983, Ser. No. 468,920
Int. Cl.⁴ H01L *21/283*
U.S. Cl. 29—570 **7 Claims**



1. A method for fabricating a composite dielectric layer over a first conductive layer in an integrated circuit fabrication, comprising the steps of:

providing a substrate;

providing a first conductive layer over said substrate, said first conductive layer being polycrystalline and comprising doped silicon;

forming a silicon dioxide layer over said first conductive layer;

forming a silicon nitride layer over said silicon dioxide layer;

forming a bottom capacitor plate by selectively clearing areas of said silicon substrate where a plurality of transistors are to be formed;

oxidizing said cleared areas of said silicon to form a plurality of gate oxides, and simultaneously partially oxidizing said nitride layer, whereby a composite oxide/nitride/oxide dielectric is provided over said first conductive layer; and

depositing a second conductive layer selectively over said locations of said plurality of transistors and over portions of said first conductive layer.

4,577,391

METHOD OF MANUFACTURING CMOS DEVICES

Steve Hsia, Cupertino, and Paul Chang, Los Altos, both of Calif., assignors to Monolithic Memories, Inc., Santa Clara, Calif.

Filed Jul. 27, 1984, Ser. No. 635,371
Int. Cl.⁴ H01L *21/265, 21/32*
U.S. Cl. 29—571 **10 Claims**

1. The method of forming a semiconductor structure in and on a substrate having an N region and a P region extending to the surface of said substrate, said method comprising:

forming a first gate over a portion of said P region and a second gate over a portion of said N region;

forming a first and a second N^- source/drain region in said P region separated by a channel portion of said P region underlying said first gate;

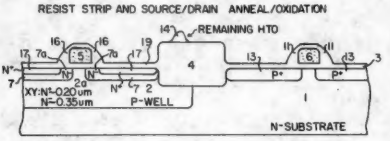
forming a first and a second sidewall spacer having a first selected width abutting the respective ends of said second gate;

forming, using said second gate and said first and second sidewall spacers a a mask, a first and a second P^+ source/drain region in said N region separated by a channel portion of said N region underlying said second gate;

forming a third and a fourth sidewall spacer having a second selected width abutting, the ends of said first gate;

forming, using said first gate and said third and fourth sidewall spacers as a mask, a first and a second N^+ source/drain region within said first and said second N^- source drain regions, respectively;

annealing after forming said first and second P^+ source/drain regions and said first and second N^+ source/drain regions,



wherein said first width is selected to be sufficiently narrow so that after said annealing, said P^+ source/drain regions extended laterally at least to the respective ends of said second gate, and wherein said second width is selected sufficiently wide so that after annealing, a portion of said first N^- source/drain region underlaps said first gate and separates said first N^+ source/drain region from said channel portion of said P region and a portion of said second N^- source/drain region underlaps said first gate and separates said second N^+ source/drain region from said channel portion of said P region and said N^+ source/drain regions are laterally separated from said first gate.

4,577,392

FABRICATION TECHNIQUE FOR INTEGRATED CIRCUITS

David R. Peterson, Mountain View, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Aug. 3, 1984, Ser. No. 637,449
Int. Cl.⁴ H01L *21/283, 21/28, 21/56*
U.S. Cl. 29—571 **7 Claims**

1. A method for forming conductive contacts to first and second regions separated by a third region of a respective one of an n-type and a p-type substrate having a portion of a surface thereof covered to a first thickness with an insulating layer having a slot therethrough which extends substantially to said surface, said surface in said slot being covered with an isolation layer, said slot having a sidewall structure having first and second edges, a conductive island covering said surface portion within said slot to substantially said first thickness and having a bank having first and second areas facing, respectively, said first and second edges of said sidewall structure, said first region and said second region being non-contiguous with one another, being located, respectively, between said first area of said bank and said first edge of said sidewall structure and said second area of said bank and said second edge of said sidewall structure, and being non-contiguous with said bank, said third region being generally beneath said island, said first and second regions being a respective other of n-type and p-type than is said substrate, comprising:

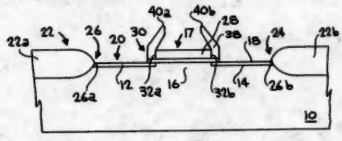
providing said substrate with said island covered with a first sacrificial layer which extends beyond said first thickness;

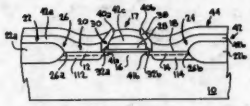
covering said insulating layer, said conductive island, and said isolation layer with a generallly conformal coating of a dielectric material;

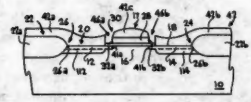
anisotropically orthogonally etching said coating of said dielectric material off of said insulating layer, said isola-

tion layer and said first sacrificial layer while retaining sacrificial portions of said dielectric material between said first area of said bank and said first region and between said second area of said bank and said second region;

removing said first sacrificial layer from said island and said isolation layer from said first region and said second region without significantly removing said sacrificial portions of said dielectric material;







depositing a conductive layer in covering relation upon said insulating layer, said island, said first region and said second region;

laying down a second sacrificial layer upon said conductive layer; and

etching away said second sacrificial layer and said sacrificial portions of said dielectric material while not significantly removing said conductive layer.

4,577,393

PROCESS FOR THE PRODUCTION OF A SOLAR CELL

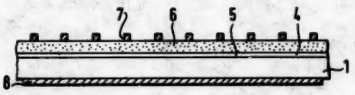
Wilfried Schmidt, Talheim, Fed. Rep. of Germany, assignor to Telefunken electronic GmbH, Heilbronn, Fed. Rep. of Germany

Filed Nov. 8, 1984, Ser. No. 669,526

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1983, 3340874

Int. Cl.⁴ H01L *31/18*

U.S. Cl. 29—572 **17 Claims**



1. A process for producing a solar cell with a p-n junction and a conductive antireflection coating, wherein there is deposited on the front surface of a semiconductor body a first layer serving as a diffusion source for the production of the p-n junction and also for the doping of the antireflection coating, wherein a second layer for the production of the antireflection coating is deposited on the first layer, and wherein an annealing process is performed in which the p-n junction is produced, the antireflection coating is formed from the two layers, and the antireflection coating is doped and thereby made highly conductive.

4,577,394

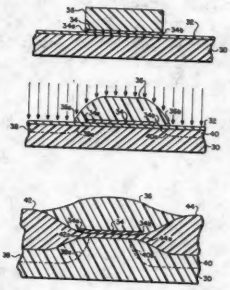
REDUCTION OF FIELD OXIDE ENCROACHMENT IN MOS FABRICATION

John L. Peel, Sandy, Utah, assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Oct. 1, 1984, Ser. No. 655,810

Int. Cl.⁴ H01L *21/76, 21/316*

U.S. Cl. 29—576 W **10 Claims**



7. A method for reducing field oxide and field doping encroachment into an active area of a semiconductor substrate during the fabrication of an active device in said active area, said method comprising the steps of:

masking said active area with a pattern including a layer of anti-oxidant material deposited over said substrate surface and a layer of doped glass passivating material layer formed over said anti-oxidant layer;

flowing said passivation to cover both said anti-oxidant layer and a region of said substrate surface adjacent, but not covered by said anti-oxidant layer;

growing, over the portion of said substrate surface not covered by said anti-oxidant and passivation layers, a layer of oxide material.

4,577,395

METHOD OF MANUFACTURING SEMICONDUCTOR MEMORY DEVICE HAVING TRENCH MEMORY CAPACITOR

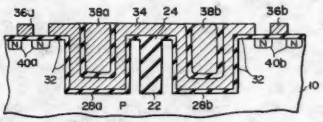
Tadashi Shibata, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 13, 1984, Ser. No. 681,129

Claims priority, application Japan, Jan. 13, 1984, 59-4364

Int. Cl.⁴ H01L *27/10, 29/78*

U.S. Cl. 29—576 C **6 Claims**



1. A method of manufacturing a semiconductor memory device having a trench memory capacitor comprising the steps of:

forming a first mask in an element forming region of a semiconductor substrate formed of said element forming region and an element isolation region;

depositing a film formed of a material different from that of

said first mask on an entire surface of the resultant structure, and etching said film by anisotropic dry etching so as to leave said film around said first mask as a second mask;

selectively etching said semiconductor substrate using said first and second masks as an etching mask so as to form a first groove in said element isolation region;

burying an insulation film in said first groove;

etching said first mask at least above a memory capacitor forming region in said element forming region so as to form a third mask on a portion excluding said memory capacitor forming region;

selectively etching said semiconductor substrate by using said second and third masks and said insulation film buried in said first groove as an etching mask so as to form a second groove in said memory capacitor forming region, thereby defining the distance between said first and second grooves by said second mask in a self-alignment manner; and

forming a capacitor electrode in said second groove through a gate insulation film.

4,577,396

METHOD OF FORMING ELECTRICAL CONTACT TO A SEMICONDUCTOR SUBSTRATE VIA A METALLIC SILICIDE OR SILICON ALLOY LAYER FORMED IN THE SUBSTRATE

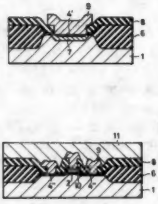
Naoki Yamamoto, Kawaguchi, and Noriyuki Sakudo, Ohme, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 15, 1984, Ser. No. 610,485

Claims priority, application Japan, May 16, 1983, 58-84221

Int. Cl.[4] H01L *21/28, 21/265;* C23F *1/02*

U.S. Cl. 29—576 B **30 Claims**



1. A method of providing an electrical connection to a surface of a semiconductor substrate, comprising the step of: inplanting ions, of metal which can form metallic silicides or silicon alloys with silicon upon heating, into a desired portion of an impurity-doped region of a semiconductor substrate, said desired portion extending to the surface of the substrate, to form an ion-implanted region in the impurity-doped region; forming metallic silicides or silicon alloys in said ion-implanted region by heating; and forming a wiring layer or electrode in electrical connection with and on the surface of said ion-implanted region, whereby an ohmic contact is formed without peeling of the wiring layer or electrode from the ion-implanted region and wherein any decrease in the impurity concentration in the impurity-doped region is minimized.

4,577,397

METHOD FOR MANUFACTURING A SEMICONDUCTOR DEVICE HAVING VERTICAL AND LATERAL TRANSISTORS

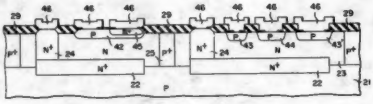
Shigeru Komatsu, Yokohama; Hiroshi Inoue, Tokyo, and Michio Nakamura, Kawasaki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Division of Ser. No. 523,062, Aug. 15, 1983, abandoned, which is a continuation of Ser. No. 152,296, May 22, 1980, abandoned. This application Jan. 9, 1985, Ser. No. 689,966

Claims priority, application Japan, May 24, 1979, 54-63218

Int. Cl.[4] H01L *21/425*

U.S. Cl. 29—576 B **4 Claims**



1. A method for manufacturing from a silicon substrate a semiconductor device including a vertical transistor having a first semiconductor region of a first conductivity type, a second semiconductor region of a second conductivity type opposite to the first conductivity type formed in the first semiconductor region and a third semiconductor region of the first conductivity type formed in the second semiconductor region, and a lateral transistor having a fourth semiconductor region of the first conductivity type, a fifth semiconductor region of the second conductivity type formed in the fourth semiconductor region and a sixth semiconductor region of the second conductivity type formed in the fourth semiconductor region and spaced from the fifth semiconductor region, the method comprising the steps of:

(a) forming, within the silicon substrate and extending from a first surface thereof, the first and fourth semiconductor regions, and isolating the first and fourth semiconductor regions from one another and providing each with an exposed surface at the first surface of the silicon substrate;

(b) forming on the first surface of the silicon substrate an anti-oxidation mask having a first mask portion at the desired location of the second semiconductor region and second and third mask portions, each spaced from the first mask portion, the mask leaving exposed the exposed surface of the fourth semiconductor region;

(c) simultaneously and selectively forming, with the forming step (b), a thick countersunk first oxide layer on the portions of the first surface of the silicon substrate including the exposed surface of the fourth semiconductor region, where the mask is not formed, by heat oxidizing the first surface of the silicon substrate;

(d) removing the first mask portion to form a first opening;

(e) selectively removing portions of the first oxide layer formed on the surface of the fourth semiconductor region at the desired location of the fifth and sixth semiconductor regions, thereby forming second and third openings partially exposing the surface of the fourth semiconductor region;

(f) forming the second, fifth and sixth semiconductor regions by introducing an impurity of the second conductivity type through the first, second and third openings; and

(g) forming the third semiconductor region by introducing an impurity of the first conductivity type into the second semiconductor region.

4,577,398

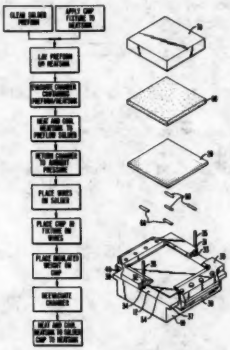
METHOD FOR MOUNTING A SEMICONDUCTOR CHIP

John W. Sliwa, Los Altos Hills; Roy J. Burt, Sunnyvale; Chune Lee, San Francisco; John MacKay, Saratoga, and Cindy A. Johnson, Sunnyvale, all of Calif., assignors to Trilogy Computer Development Partners, Ltd., Cupertino, Calif.

Filed Sep. 7, 1984, Ser. No. 648,570

Int. Cl.[4] H01L *23/12*

U.S. Cl. 29—590 35 Claims



1. A method for attaching a semiconductor chip to a mounting surface comprising the step of:

applying a solder barrier to the mounting surface;

placing a prefrom of solder within the solder barrier;

heating and then cooling the preform in a vacuum to preflow the solder and secure the solder to the mounting surface substantially without voids;

locating the simconductor chip overlying the preflowed solder; and

reheating and then recooling the solder in a vacuum to secure the semiconductor chip to the mounting surface with the intervening solder.

4,577,399

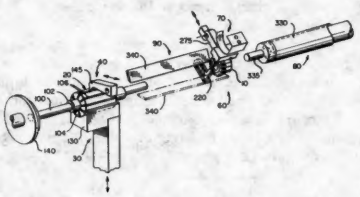
COMMUTATOR PLACING MACHINE

Kenneth A. Ott, Ludlow Falls, Ohio, assignor to Ott-A-Matic, Inc., Vandalia, Ohio

Filed May 29, 1984, Ser. No. 614,922

Int. Cl.[4] H01R *43/06*

U.S. Cl. 29—733 4 Claims



1. A commutator placing apparatus comprising

means for directing a commutator into a loading position, means for orienting said commutator including

(a) a first, fixed positioning means,

(b) a second, movable positioning means, said second positioning means including a commutator index slide movable from a first position to a second position and a commutator index pawl resiliently carried by said index slide and mounted above said commutator, and

(c) means for moving said index slide,

wherein said index pawl engages the commutator as said index slide is moved from the first position to the second position to impart to the commutator a rotational force to insure that it is properly oriented with respect to said first positioning means.

4,577,400

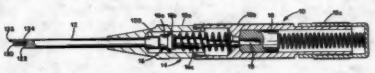
PIN INSERTION TOOL

Thomas A. Morgan, Billerica, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Feb. 1, 1984, Ser. No. 576,071

Int. Cl.[4] H05K *3/30*

U.S. Cl. 29—739 27 Claims



1. A hand tool for inserting wire-wrap pins contained within a fanning strip, said fanning strip having a band section and a number of tubular sections for containing said pins, into holes of a wire-wrap printed circuit board or panel, said tool comprising:

a handle member including an automatic anvil and means for delivering an impact to said anvil; and,

a solid cylindrical tip, one section of said tip being mounted within said handle member and coupled to said anvil for receiving said impact from said anvil during an insertion operation and another section extending beyond said handle member, one end of said other section farthest away from said handle member having a stepped profile including a plurality of steps, a first one of said steps 120 having a hole for vertically positioning each of said pins during said insertion operation, said hole having a bottom which is a predetermined longitudinal distance from the end of a first adjacent step for preestablishing a depth at which said each pin can be driven into a selected one of said holes in said board and said first step and a second adjacent step being dimensioned for receiving corresponding ones of said band and tubular sections, respectively, when ejecting each of said pins completely from said strip into said selected one of said holes without damage or deformation to said strip or to the surrounding installation area during said insertion operation.

4,577,401

PROCESS AND APPARATUS FOR SEPARATING A SUSPENSION BAR FROM AN ELECTRODE

Constant T. Verhoeven, Poederlee; Hubert J. Tobback, Lichtaart, and John M. Dompas, Olen, all of Belgium, assignors to Metallurgie Hoboken-Overpelt, Hoboken, Belgium

PCT No. PCT/BE82/00025, § 371 Date Aug. 4, 1983, § 102(e) Date Aug. 4, 1983, PCT Pub. No. WO83/02289, PCT Pub. Date Jul. 7, 1983

PCT Filed Dec. 22, 1982, Ser. No. 520,209

Claims priority, application Luxembourg, Dec. 24, 1981, 83857

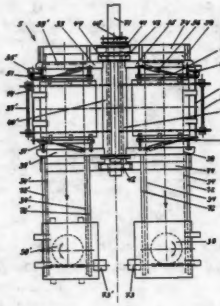
Int. Cl.[4] H01R *43/00;* B23P *19/00*

U.S. Cl. 29—825 15 Claims

1. In an electrode comprising an electrolytic plate having one or more suspension loops attached to the plate and a suspension bar extending through the loops for vertical support of the plate, a method for separating the bar from the loops of the plate which comprises moving the plate from a vertical position to a substantially horizontal position; positioning the plate on support means thereby relieving the weight of the plate on the bar; and removing the bar from the loops of the plate while the plate is in contact with the support means.

7. In an electrode comprising an electrolytic plate having one or more suspension loops attached to the plate and a suspension bar having an longitudinal axis extending through the loops for vertical support of the plate, an apparatus for separat-

ing the bar from the loops of the plate comprising means for moving the plate from a vertical position to a substantially horizontal position; means operatively associated with the moving means for supporting the plate in the horizontal position to relieve the weight of the plate on the bar; and means operatively associated with the support means for removing the bar from the loops of the plate while the plate is in contact with the support means.

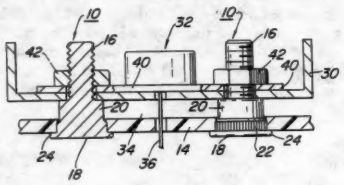


4,577,402

STUD FOR MOUNTING AND METHOD OF MOUNTING HEAT SINKS ON PRINTED CIRCUIT BOARDS

Kenneth A. Swanstrom, Buckingham Township, Bucks County, Pa., assignor to Penn Engineering & Manufacturing Corp., Danboro, Pa.

Filed Jun. 13, 1984, Ser. No. 620,141
Int. Cl.[4] H05K *3/39*; F16B *39/00, 37/04, 39/282*
U.S. Cl. 29—840 **8 Claims**



1. The method of securing a heat sink and a semi-conductor case to a circuit board comprising

inserting with suitable pressure a stud into a circuit board from the underside of said circuit board, said stud having knurled portion broaching into said circuit board and a head having a flange overhanging said knurled portion to limit by abutment of the flange and the underside of the circuit board the movement of the stud relative to the circuit board,

placing said heat sink and said semi-conductor upon a shoulder formed between a threaded shank and a collar of said stud, said collar being disposed between said threaded shank and a head, said threaded shank extending through suitable openings in said heat sink and said semi-conductor case, and

attaching a threaded nut to said threaded shank so as to secure said heat sink and said semi-conductor case against said shoulder.

3. A stud for assembling a heat sink and a semi-conductor cast to a circuit board wherein

said stud comprises a threaded shank at one end for receiving a threaded nut and a flat head at the other end,

a cylindrical collar between the threaded shank and the flat head,

said collar being of smaller diameter than said head but larger diameter than said threaded shank,

said collar having a knurled portion adjacent said head for securing said stud to said circuit board,

the large diameter of said collar relative to said threaded shank defining a shoulder, an annular ring perpendicular to the axis of said shank, upon which are seated said heat sink and semi-conductor case, and

at least said head being suitably plated to facilitate its soldering to said circuit board.

4,577,403

MANUFACTURE OF TELECOMMUNICATIONS CABLE CORE UNITS

John N. Garner, Kingston, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed May 29, 1985, Ser. No. 738,714
Int. Cl.[4] H01R *43/00*; B21D *39/04*; D07B *1/06*; B65H *57/14*
U.S. Cl. 29—872 **8 Claims**

1. Apparatus for forming a core unit from telecommunications conductor units each formed of twisted together insulated conductors comprising, in a downstream direction along a passline for the conductor units:

a position changing means for changing the positions of laterally spaced-apart conductor units across the passline and relative to other conductor units;

conductor unit array forming means comprising at least two rollers having rotational axes one downstream from the other with opposed peripheral surfaces of the rollers spaced apart one on each side of the passline, each surface changing in diameter along its length with one surface having its smallest diameter and the other its largest diameter at a position intermediate its axial ends, the positions and configurations of the surfaces being such that together they are operable to position the conductor units in an array as the conductor units move towards, past and then beyond the rollers, the array extending in two planes in a section taken across the passline, the rollers enabling the conductor units to move across the array dependent upon the positional change caused by the position changing means; and

a core unit forming means for causing convergence of the conductor units in the array to bring them together with the relative positions of the conductor units changing in the core unit as they extend along the core unit, each conductor unit extending around the axis of the core unit alternately in opposite directions as influenced by its movement across the array.

4,577,404

CONNECTOR POLARIZATION METHOD

Thomas P. Pellegrino, Lisle, Ill., assignor to Molex Incorporated, Lisle, Ill.

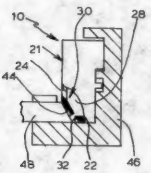
Continuation of Ser. No. 555,852, Nov. 28, 1983, abandoned. This application Jul. 29, 1985, Ser. No. 761,321
Int. Cl.[4] H01R *43/16*
U.S. Cl. 29—874 **3 Claims**

1. A method of selectively polarizing a female connector with respect to one of a plurality of arrays of mating pin conductors comprising the steps of:

mounting a plurality of pin conductors to form said arrays, each array including a plurality of pin locations in a row,

at least some of said positions having pin conductors mounted thereat and other of said positions defining blank positions;

providing a female connector including a housing having an exterior end wall, a pair of opposing parallel spaced apart exterior side walls extending from opposite edges of the end wall, and a plurality of terminal receiving cavities formed between said side walls and the end wall, each cavity having a pin receiving opening formed in the end



wall alignable with and corresponding to the pin locations of the arrays, and a plurality of female pin receiving terminals mounted in at least some of said cavities adjacent the opening to receive a corresponding pin conductor therethrough; and

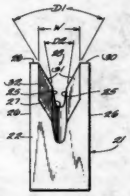
deforming the female connector housing to form individual deformed sections blocking only the pin receiving openings corresponding to the blank positions of a particular pin array.

4,577,405

COMPOUND-ANGLE BLADE FOR STRIPPING INSULATED ELECTRICAL CONDUCTORS

John D. Butler, New Berlin, Wis., assignor to Mechtrix Corporation, Wauwatosa, Wis.

Filed Sep. 17, 1984, Ser. No. 651,830
Int. Cl.[4] H02G 1/12
U.S. Cl. 30—90.1 **9 Claims**



1. A blade for cutting and stripping insulation from insulated electrical conductors comprising a member formed as a rectangular parallelopiped having first and second faces and surfaces connecting the faces, one of the surfaces being formed with an opening extending between the faces and extending at a compound angle toward the interior of the member, the angled opening being defined by a first pair of walls converging at a first angle toward the interior of the member and a second pair of walls intersecting the first pair of walls and converging at a second non-parallel angle greater than 0 degrees but less than 54 degrees toward the interior of the member to accommodate different size conductors, the opening terminating in a radius cutting edge adapted to partially encircle a round conductor to cut the insulation, the second pair of angled walls being tangent to the cutting edge,

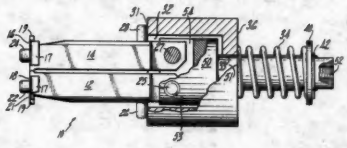
so that an insulated conductor is gathered into the opening between the first pair of walls and guided to the cutting edge along the second pair of walls.

4,577,406

RETRACTING INTERNAL TUBE CUTTER

Joseph J. Idzik, and Charles H. Kouse, both of Springfield, Ohio, assignors to Elliott Turbomachinery Co., Inc., Jeannette, Pa.

Filed Sep. 26, 1984, Ser. No. 655,118
Int. Cl.[4] B23D 21/14
U.S. Cl. 30—103 **5 Claims**



1. A retracting internal tube cutter which comprises:

a tube cutter body including pivotable mounting means and means through which said body may be caused to rotate;

at least two swing arms pivotably mounted to the pivotable mounting means such that upon rotation of the body the swing arms are forced outwardly;

cutter blades mounted on the ends of the swing arm to extend outwardly to effect cutting;

a retractor mounted to selectively engage the swing arms to prevent the swing arms from extending outwardly except when desired;

said retraction means including a spring biased slidable retractor which has a first at rest position encasing a portion of the swing arms to prevent outward displacement of the swing arms and a second retraction position wherein the retractor has been slidably displaced to allow outward displacement of the swing arms;

said tube body including a mounting portion defining a slot in which the swing arms are pivotally mounted and the retractor is annular in configuration and defines an arm containing space which is sized to slide over the mounting portion of the tube body and the swing arms mounted therein; and

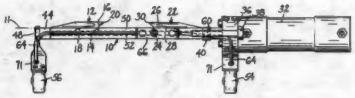
wherein the retractor defines a body opening through which an extension portion of the body extends and includes a spring mounted about the body extension and engaging the retractor; a retractor washer mounted to the body extension a distance from the retractor for engaging the spring; and a snap ring, securing the washer in position, wherein said spring biases the retractor away from the retractor washer to encase the swing arms for preventing outward displacement and wherein upon rotation of the tube cutter the swing arms are forced outwardly displacing the retractor and compressing the retractor spring to allow the swing arms to engage a workpiece.

4,577,407

DEHORNER

A. David Hahn, Middletown, Conn., assignor to Jarvis Products Corporation, Middletown, Conn.

Filed Jun. 25, 1984, Ser. No. 624,297
Int. Cl.[4] B26B 17/00
U.S. Cl. 30—180 **7 Claims**



1. A dehorner comprising a frame having a cutting side

defining a first plane and an opposite, operator side, a pair of opposed blades mounted in the frame and having respective parallel cutting edges, motive means responsive to actuating means to operate at least one of the blades to provide relative straight line movement of the cutting edges between an open position and a closed, cutting position, each blade having a base portion mounted within the frame and a riser portion extending outwardly of the plane of the cutting side of the frame and having a beveled portion terminating in its respective cutting edge, the cutting path defined by movement of the cutting edge of at least one of the blades lying in a second plane spaced from the plane defined by the cutting side of the frame and parallel thereto.

4,577,408

HAIR-CUTTING DEVICE

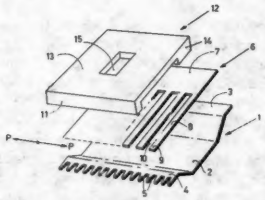
Eduard W. Tietjens, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 8, 1983, Ser. No. 559,515

Claims priority, application Netherlands, Dec. 13, 1982, 8204808

Int. Cl.⁴ B26B *19/06*

U.S. Cl. 30—222 **1 Claim**



1. A hair-cutting devicd comprising a stationary cutter; a drivable cutter reciprocatingly movable with respect to the stationary cutter, each cutter being provided with teeth extending substantially at right angles to the driving direction; each tooth of the drivable cutter being formed at the free end of a flexible arm, the respective flexible arms being spaced from each other to provide a slot between each pair of adjacent flexible arms; a rigid pressure element located adjacent to and within the range of elastic deflection of the free ends of the respective flexible arms; and protrusions formed on the rigid pressure element and respectively extending into the slots between the pairs of adjacent flexible arms, each protrusion having two converging oblique pressure surfaces for engagement by said flexible arms upon deflection thereof; the opposite end of each flexible arm being connected to a common cutter beam, the respective flexible arms and the cutter beam being integrally formed in one piece from a flexible sheet material.

4,577,409

PEN CHANGING APPARATUS FOR PLOTTER

Masami Sakamoto; Ryoichi Nagumo, and Tamio Ishihara, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 24, 1985, Ser. No. 737,480

Int. Cl.⁴ B43L *13/00*; G01D *15/16*

U.S. Cl. 33—18.1 **16 Claims**

1. A pen changing apparatus for a plotter comprising:

a plurality of pens;

a carriage which slides linearly with a shaft as the sliding axis thereof and on which a plurality of pens are mounted in alignment with the axial direction of said shaft;

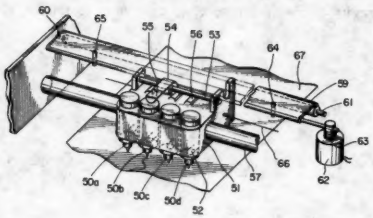
a moving means for moving said carriage;

a guide shaft which is fixed onto said carriage in the same direction as said shaft;

a sliding lever provided on said guide shaft such as to be movable in the axial direction of said guide shaft and rotatable around said guide shaft for pressing any of said plurality of pens;

positioning and retaining means for positioning said sliding lever over any of said plurality of pens and retaining the same when said sliding lever is moved;

stoppers provided approximately at both end portions of the travelling range of said carriage for stopping said sliding



lever along at a position over a desired pen at the time of moving said carriage; and

sliding lever driving means for rotating said sliding lever so as to press down said pen in the position where said sliding lever is located in resistance to a pen lifting spring or restore said pen to its original position by the urging force of said pen lifting spring.

4,577,410

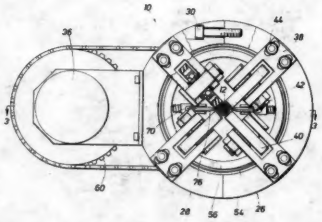
METHOD AND APPARATUS FOR PROVIDING ACCURATE WIRELINE DEPTH MEASUREMENTS

Thomas E. Ritter, Katy, Tex., assignor to Halliburton Company, Duncan, Okla.

Filed Jun. 11, 1985, Ser. No. 743,447

Int. Cl.⁴ G01B *5/04*

U.S. Cl. 33—129 **12 Claims**



1. For use with tools lowered into a well borehole on a wireline having multiple strands wrapped into a running helix and where the wireline passes over a sheave above the borehole and into the borehole to support a tool at depths limited by the depth of the well and wherein the tool is subject to be raised or lowered in the well, apparatus for measuring the length of wireline in the borehole which apparatus comprises:

(a) wellhead mounting means positioned adjacent to the locus of the wireline supporting a tool in the well borehole;

(b) wireline guide means positioning the wireline along a specified path relative to said mounting means, said guide means cooperatively securing the wireline in a taut path in conjunction with the weight of a tool suspended in the borehole by the wireline;

(c) helix follower means engaging a helix defined by the multiple strands of the wireline, said means moving in circular movement as the helix moves therepast and wherein said means follows said helix for multiple revolutions dependent on wireline movement therepast; and

(d) signal forming means connected to said follower means

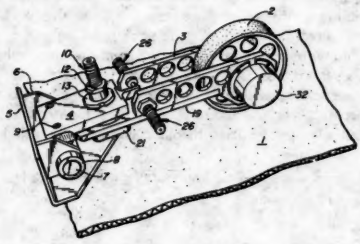
for forming a signal proportional to revolutions of said follower means as the helix moves therepast, said signal forming means forming the signal dynamically as the helix moves therepast.

4,577,411

WHEEL FOR MEASURING HORIZONTAL TRAVELING STRIP

Merrill D. Martin, 2 Mall Court, Oakland, Calif. 94611

Filed Apr. 15, 1985, Ser. No. 723,490
Int. Cl.[4] G01B 7/04
U.S. Cl. 33—141 E 6 Claims



1. In a device for measuring the horizontal travel of a flat strip of material through a machine by means of a rotating wheel which engages the surface of said material and is connected to a digital counting mechanism, the improved method of support comprising:

a carriage positioned on said machine and disposed for pivoting in a vertical plane;

an arm extending horizontally from said carriage, one end being pivotally mounted thereon to permit pivoting of said arm in a horizontal plane;

said rotating wheel being rotatably on the opposite end of said arm;

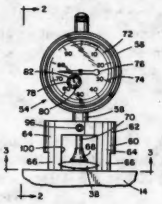
whereby engagement between said wheel and said material is maintained despite horizontal or vertical deviation of said horizontal travel of said material from a straight line.

4,577,412

RHEOMETER ROTOR HEIGHT GAUGE

Robert L. McKinney, Mogadore, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 18, 1984, Ser. No. 662,235
Int. Cl.[4] G01B 3/22
U.S. Cl. 33—172 R 7 Claims



1. A rheometer rotor height gauge for facilitating adjustment of the height of a rotor of a rheometer in relation to a die of the rheometer, the gauge comprising:

an indicator for visual indicating variation of a position variable;

a movable rotor contact member depending from and operatively connected to the indicator for contacting the rheometer rotor, whereby the position variable indicated by the indicator is rotor height;

a base for supporting the indicator atop the die of the rheometer and supporting the rotor contact member atop the rotor in which the base includes a cylindrical pedestal, arcuate legs define a clear viewing gap for viewing the rotor contact member through the base, and feet, the pedestal being atop the legs and the legs being atop the feet; and

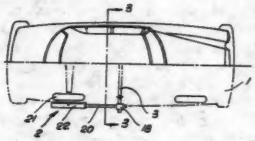
leg portions depending downward of the pedestal between the feet for protecting the rotor contact member.

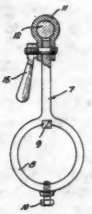
4,577,413

AUTOMOTIVE WHEEL ALIGNMENT GAUGE APPARATUS

James H. Mason, 786 Pittwater Road, Brookvale, New South Wales, 2100, Australia

Filed Oct. 12, 1984, Ser. No. 660,456
Claims priority, application Australia, Oct. 14, 1983, PG18477; Dec. 20, 1983, PG2919; May 20, 1984, PG5087
Int. Cl.[4] G01B 5/255
U.S. Cl. 33—203.18 9 Claims





1. An automotive gauge apparatus for rear wheel alignment comprising:

an elongate datum bar;

attachment means for securing and horizontally positoning said datum bar to the underneath of a vehicle perpendicular to the desired direction of foreward moton of the vehicle, said attachment means including a pair of hangers, each having a banjo portion adapted to selectively clampingly secure said datum bar, and an attachment portion adapted to engage a formation on the underneath of the vehicle, the attachment portion including a yoke and a mating portion rotatably supported therein, the mating portion designed to rigidly engage the formation on the underneath of the vehicle;

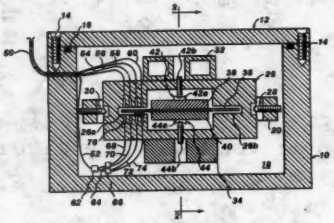
wheel conforming means defining a horizontal line perpendicular to the axis of rotation of a rear wheel; and

measuring means sensing the angular displacement between said elongate datum bar and said wheel conforming means.

4,577,414
REMOTELY READABLE FIBER OPTIC COMPASS

Albert Migliori, Santa Fe; Gregory W. Swift, Los Alamos, both of N. Mex., and Steven L. Garrett, Pebble Beach, Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 30, 1985, Ser. No. 728,976
Int. Cl.[4] G01C 17/26
U.S. Cl. 33—363 K 8 Claims



1. A remotely readable compass, comprising:

a magnet rotatably mounted in a compass body so as to be freely rotatable with respect to said compass body, a rotatable sheet polarizer affixed to said magnet so as to be rotatable with respect to said compass body with said magnet about a common axis of rotation;

first and second excitation optical fibers affixed to said compass body and terminating adjacent said rotatable sheet polarizer so as to direct light propagated through said fibers onto said rotatable sheet polarizer, and first and second return optical fibers affixed to said compass body and positioned respectively opposite said rotatable sheet polarizer from said excitation fibers, so as to receive light which is emitted from said first and second excitation fibers and transmitted through said rotatable sheet polarizer; and

first and second fixed sheet polarizers, said first fixed sheet polarizer being affixed to said compass body so as to be optically interposed between said first excitation fiber and said first return fiber, said second fixed sheet polarizer being affixed to said compass body so as to be interposed between said second excitation fiber and said second return fiber, said fixed sheet polarizers having optical axes which are oriented substantially orthogonally with respect to one another;

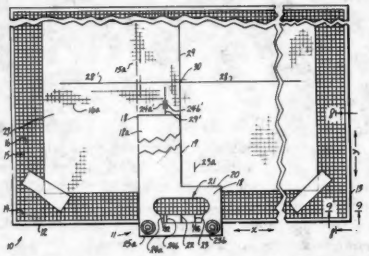
whereby the orientation of said magnet with respect to said compass body can be determined by transmitting two light beams through said excitation fibers, through said fixed sheet polarizers and through said rotatable sheet polarizer, and measuring the ratio of the intensities of the resulting light beams received in said return fibers.

4,577,415
WINDOWED INDEXED CALIBRATED T-SQUARE AND PRECISION-LINED DRAFTING BOARD HAVING LINEAR EDGES

Saul Schiller, Brooklyn, N.Y.

Continuation-in-part of Ser. No. 149,711, May 14, 1980, Pat. No. 4,422,245, which is a continuation-in-part of Ser. No. 28,198, Apr. 9, 1979. This application Dec. 19, 1983, Ser. No. 563,154
Int. Cl.[4] B43L 7/00
U.S. Cl. 33—430 5 Claims

1. A scribing T-square consisting essentially of a blade having a straight edge along a first longitudinal axis of the blade, and a helve head unitary and rigidly connected with a proximal end of the blade, said helve head having an elongated portion elongated along a second longitudinal axis extending substantially at right angles to said straight edge, and at-least two spaced-apart flat-bottomed rollers each of predetermined roller-surfaces of widths sufficiently wide to jointly maintain said blade at a constant and parallel relationship with a scribing surface when the roller-surfaces are pressed against a first upright flat edge-surface of a flat scribing board, said widths being sufficiently wide to be the equivalent of spaced-apart rollers of a tripod arrangement, said rollers being mounted in series with one-another substantially aligned with said second longitudinal axis and axes of the rollers being positioned such that said roller-surfaces are rollable flushly against an upright flat edge-surface of a scribing board having an upper flat face and such that said roller-surfaces are rollable along said second longitudinal axis when pressed against the upper flat edge-surface of a scribing board, mounted on roller-axes and extending downwardly from a lower surface of said elongated portion and extending substantially transversely to said first and second longitudinal axes whereby the scribing T-square is prevented from wobbling on the helve head and the blade relative to the upper flat face of a scribing board when in use therewith, and said helve head being structured and shaped to form a closed-throated window and said helve head having an upper surface embodying the closed-throated window, and said location being spaced-across from a lower end of the straight edge and aligned therewith, said roller-axes being mounted on said elongated portion and extending downwardly relative to a lower surface of said elongated portion, mount-positions of said roller-axes being at locations positioned below said closed-throated window, said scribing board having said upper flat face and having said upright flat edge-surface extending along an imaginary x-axis of the scribing board, and said scribing board having a second upright edge extending along an imaginary y-axis, substantially at a right angle to said imaginary x-axis, and additionally including a first elongated member having a flat upper-surface mounted adjustably along said imaginary x-axis substantially parallel to said first upright edge, and having a top-edge toward a body-portion of the scribing board, that is linear and parallel to said first upright edge, and a first elongated member-mounting means for adjusting the first elongated member intermittently to different predetermined heights above an upper surface of the scribing board and for intermittently locking the first elongated member at any one of said different predetermined heights.



4,577,416
TRACING SENSOR

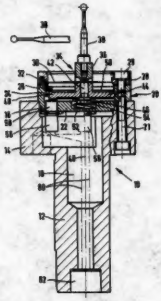
Wiesner Franz, Owen, Fed. Rep. of Germany, assignor to Traub GmbH, Reichenbach, Fed. Rep. of Germany

PCT No. PCT/EP83/00290, § 371 Date Jul. 5, 1984, § 102(e) Date Jul. 5, 1984, PCT Pub. No. WO84/01820, PCT Pub. Date May 10, 1984
PCT Filed Nov. 4, 1983, Ser. No. 629,728
Claims priority, application Fed. Rep. of Germany, Nov. 5, 1982, 8231029[U]
Int. Cl.[4] G01B 7/28
U.S. Cl. 33—561 7 Claims

1. A tracing sensor comprising

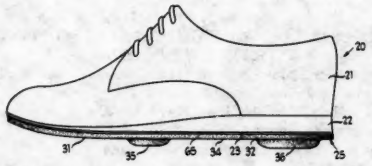
a pot-shaped housing (20) having a closed bottom (22) and an inner shoulder (24);

an annular insert support member (26) abutting against said shoulder (24);
a disc-like member (44) arranged between said bottom (22) and said support member (26);
an annular flange (28) fastened to said housing (20);
a membrane-like, annular elastic disc (30) clamped at its radially outer edge between said support member (26) and said annular flange (28);



a sensor pin (38) secured to a pin carrier having an axially outer carrier member (36) and said disc-like member (44) as parts thereof;
said membrane-like, annular elastic disc (30) clamped at its radially inner edge between said disc-like member (44) and said axially outer carrier member (36);
a spring (54) arranged between said bottom (22) and said disc-like member (44);
a plurality of switches (56) cooperating with said disc-like member (44).

4,577,417
SOLE-AND-HEEL STRUCTURE HAVING PREMOLDED BULGES
George S. Cole, Pebble Beach, Calif., assignor to Energaire Corporation, Pebble Beach, Calif.
Filed Apr. 27, 1984, Ser. No. 604,895
Int. Cl.[4] A43B *13/20*
U.S. Cl. 36—29 20 Claims



1. Sole-and-heel structure comprising an elongated, molded, one-piece resilient outer memeber including a sole portion and a heel portion, said outer member having interior and exterior surfaces, said outer member having a construction to be highly wear resistant to enable said exterior surface to contact a support surface during use, a heel bulge molded into said heel portion and projecting from said exterior surface, said heel bulge being located under the area occupied by the heel area of one's foot, a metatarsal bulge molded into said sole portion and projecting from said exterior surface, said metatarsal bulge being located under the area normally occupied by the metatarsal area of one's foot, said sole portion having no bulges in the area normally occupied by one's toes, said heel and metatarsal bulges respectively defining heel and metatarsal cavities opening at said interior surface, said heel bulge and said metatarsal bulge respectively projecting from said exterior surface without the application of any elevated fluid pressure in said heel and metatarsal cavities, a restricted passageway molded into said outer member between said heel and metatarsal cavities and opening to said interior surface, a sealing member having a shape that matches the shape of said outer member, said sealing member being impermeable to air and having a sealing surface, and adhesive means between said sealing surface and said interior surface for hermetically attaching said sealing member to said outer member, whereby air at atmospheric pressure is permanently located in the space jointly defined by said passageway and said cavities, whereby at rest a foot on said sole-and-heel structure is cushioned comfortably on the air in said cavities, and in moving such air alternates through said passageway between said heel and metatarsal cavities so as to provide shock absorption and an alternate lifting effect by said bulges which provide forward thrust both in said heel portion and said sole portion that facilitates moving.

4,577,418
SHOE PROTECTOR
Charles E. Nagy, 500-B N. Louise St., Glendale, Calif. 91206
Filed Nov. 28, 1983, Ser. No. 555,493
Int. Cl.[4] A43B *13/22*
U.S. Cl. 36—72 B 9 Claims

4. A protector for eliminating scuffing of a shoe in its heel and upper rear portion areas as the shoe seats on a vehicle's floor behind a pedal, comprising a flexible, waterproof, wear-resistent bonnet, the bonnet having a body being sufficiently extant to form a pocket to envelop heel and upper rear portions of a shoe clear around and under its heel and including opposing upper frontal corners,
a non-folded elongated member disposed across such pocket,
companion VELCRO-material first and second strips, the first strip attached atop said non-folded member and to said bonnet adjacent a first one of said opposing upper frontal corners, a first end of the second strip being attached to another end of said non-folded member,
a noose secured to a second one of said opposing upper frontal corners,
a second end of said second strip extending through said noose,
said second strip reversible in direction against said noose to mate and lock with its companion first strip.

7. In a device for protecting heel and rear portions of a shoe, and including a bonnet for a snug fit about such portions, said bonnet having opposing upper frontal corners thereon, and an elastic band having ends each being secured to one of said opposing upper frontal corners,
the improvement comprising
a hollow expandable convoluted plastic member mounted on said elastic band,
a bushing securely mounted at each end of and to said hollow convoluted member, each said bushing having an aperture therethrough for passage of said band,

an exposed radiused annular edge included in each said bushing,

said member adapted to comfortably engage the dorsal area of a foot about which a shoe and said device thereon is mounted.

4,577,419

HIGH-TOP SHOE

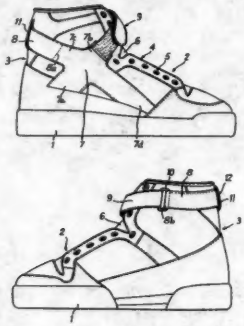
Jacques Chassaing, Neuwiller les Saverne, France, assignor to ADIDAS FaLrique de Chaussures de Sport, Landersheim, France

Filed Apr. 2, 1984, Ser. No. 596,146

Claims priority, application France, Jan. 13, 1984, 84 00488

Int. Cl.[4] A43B *7/20, 5/00, 7/14*

U.S. Cl. 36—89 **9 Claims**



1. A high-top shoe having a high-top portion with a shoe leg made of padded material,

the improvement wherein:

said shoe leg has externally secured on its outer side a piece of reinforcing material located so as to be substantially superimposed upon the outer malleolus of the shoe-wearer's ankle to provide a reinforcing zone when the shoe is worn;

at least one tightening strip extending generally around said shoe leg from said piece of reinforcing material;

said tightening strip comprising a first segment which rises obliquely from said reinforcing zone along the lateral surface of the shoe leg to adjacency with the upper edge of the shoe leg at the back of the shoe and then generally horizontally around the shoe leg to a site located above where the medial malleolus of the shoe-wearer's ankle is located when the shoe is worn;

said tightening strip further comprising a second segment which rises obliquely from said reinforcing zone along the front of the shoe leg towards the inner side of the shoe leg; and

means constructed and arranged for releasably joining said first and second segments of said tightening strip to one another in at least the vicinity of said inner side of said shoe leg so as to hold said tightening strip in position with a desired degree of tightness.

4,577,420

SKI BOOT

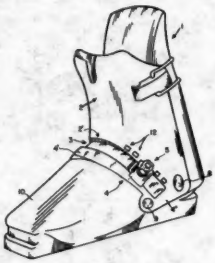
Roland Petrini, Chambery; Serge Pradier, Alby-sur-Cheran, and Michel Mabboux, Seynod, all of France, assignors to Salomon S.A., Annecy, France

Filed May 25, 1984, Ser. No. 614,048

Claims priority, application France, May 30, 1983, 83 09449

Int. Cl.[4] A43B *5/04*

U.S. Cl. 36—117 **31 Claims**



1. A ski boot having an instep, comprising:

(a) an upper comprising a front portion having a bottom portion;

(b) a shell base having two lateral sides;

(c) means for controlling the rigidity and flexional characteristics of said boot, wherein said control means comprises:

(i) a flexion band comprising an arch having two ends, wherein said arch extends across said instep of said boot, and two substantially horizontal lateral arms each attached to one end of said arch and extending along one lateral side of the shell base, and connected to said bottom portion of said front portion of said upper; and

(ii) means for maintaining a portion of said flexion band at a fixed position with respect to said shell base, wherein said fixed position is substantially in a zone in which said arch is connected to each of said lateral arms; and

(d) a journal, spaced from said fixed position, wherein said upper is adapted to pivot at least partially on said shell base around said journal, wherein each lateral arm extends continously between said fixed position and said journal.

4,577,421

FOOT LOCKING DEVICE PARTICULARLY FOR FRONT ENTRANCE SKI BOOTS

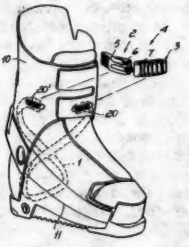
Mariano Sartor, Montebelluna, Italy, assignor to Nordica S.p.A., Montebelluna, Italy

Filed Aug. 14, 1984, Ser. No. 640,627

Claims priority, application Italy, Sep. 2, 1983, 22827/83[U]

Int. Cl.[4] A43B *5/04, 11/00*

U.S. Cl. 36—119 **11 Claims**



1. A foot locking device particularly for a front entrance ski

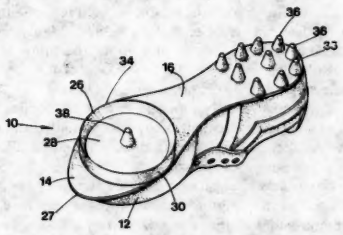
boot with a composite boot structure and with an inner boot arranged within said ski boot, the ski boot having a longitudinal direction, a widthwise direction and an upwards direction, the inner boot having outside surface portions facing said composite ski boot structure and including a heel bottom region surface portion extending along said longitudinal and widthwise directions, an Achilles tendon region surface portion extending in said upwards direction, an upper instep region surface portion, a front leg region surface portion, a talus region surface portion joining the upper instep region surface portion with the front leg region surface portion, the foot locking device comprising within said ski boot and between said composite structure thereof and said outside surface portions of said inner boot at least one flexible band-like member having at least one portion thereof facing said talus region surface portion, at least one end portion and at least another adjustable opposite end portion spaced from said one end portion thereof, at least one section of said flexible band-like member extending over said Achilles tendon region surface portion of said inner boot, said flexible band-like member having further at least one second section extending over said talus region surface portion, closure means connecting said one end portion and said another opposite end portion and adapted in closed position thereof to pull said one end portion and said another end portion towards each other thereby to tighten said band-like around said inner boot and press said at least one section of the band-like member against said Achilles tendon region surface portion in the direction towards said talus region surface portion.

4,577,422

ATHLETIC SHOE WITH IMPROVED PIVOT CLEATING

Michael L. Tanel, 119 N. 92nd St., Milwaukee, Wis. 53226

Filed Dec. 27, 1983, Ser. No. 565,746
Int. Cl.[4] A43B *5/02, 5/00;* A43C *15/16*
U.S. Cl. 36—126 **9 Claims**



1. In an athletic shoe of the type having a sole with a main sole surface and cleats extending therefrom to provide traction, such sole having a heel portion, an arch portion, a ball-of-the-foot portion, and a toe portion, the improvement comprising:

a cleat forming a substantially circular edge encompassing substantially the entire ball-of-the-foot and toe portions of the sole and extending across substantially the entire width thereof;

said cleat being flexible to allow flexing of the sole; and

said cleat enclosing a sole area substantially all non-cleat portions of which are coincident with said main sole surface, said cleat having inner and outer annular surfaces angled with respect to said main sole surface and extending from said circular edge to intersection with said main sole surface,

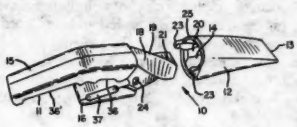
whereby both improved pivotability and traction are provided.

4,577,423

EXCAVATING TOOTH SYSTEM

Frederick C. Hahn, Aloha, Oreg., assignor to ESCO Corporation, Portland, Oreg.

Filed Dec. 24, 1984, Ser. No. 685,336
Int. Cl.[4] E02F *9/28*
U.S. Cl. 37—142 R **12 Claims**



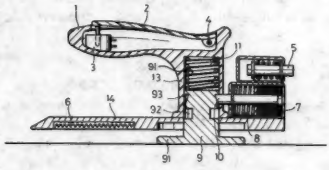
1. An excavating tooth for trenching or the like comprising an adapter member and a point member, a nose equipped with helical thread means on one member and a nose-conforming socket on the other member also equipped with helical thread means, said point member being rotatably mounted on said adapter member by movement along a longitudinal axis, said socket-equipped member being equipped with a pair of lateral tongues projecting longitudinally away from said socket, said nose member being equipped with a pair of recesses aligned with said tongues when said point member is installed on said adapter member, each of said tongues having an inner surface adapted to develop detent engagement with said recesses upon installation, said tongues being deflected as said point member is driven onto said adapter so that said inner surfaces snap into said recesses when said point member is fully installed on said adapter member, said tongues, recesses and helical thread means being the sole means securing said point member to said adapter member.

4,577,424

ELECTRICAL SAFETY IRON

Yung-Ho Liu, 111, Si Wei Street, San Chung City, Taipei Province, 241, Taiwan

Filed Aug. 24, 1984, Ser. No. 643,698
Int. Cl.[4] D06F *75/26*
U.S. Cl. 38—88 **10 Claims**



1. An electric safety iron comprising:

an iron body and a grip section for the iron;

a main control switch for controlling a heater circuit of the iron, including a normally open switch that is closed by an operator during use of the iron;

a tube interconnecting the grip section with the upper side of the iron body, said tube enclosing a hollow core;

an aperture in the iron body aligned with the hollow core of the tube;

a movable support rod slidably positioned for extension and retraction at least in part within the hollow core of the tube, said rod having a locking surface disposed thereon, the rod extending through the aperture in the iron body and terminating substantially flush with the bottom of the iron body when in its retracted position within the tube and extending beyond the bottom of the body of the iron in its extended position;

spring means normally biasing the rod toward its extended position;

a locking pin associated with the tube and movable between an extended position where it engages the locking surface of the support rod and a retracted position out of engagement with the locking surface of the rod, said rod being locked against extension when said pin engages said locking surface;

electrical control means for controlling movement of the locking pin between said extended and retracted positions, including a time delay circuit for causing retraction of the pin away from the support rod locking surface when the main control switch is left open for a predetermined time period while the iron is supplied with electrical energy; and

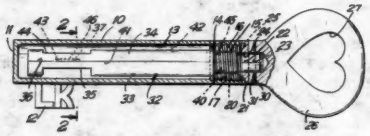
means for limiting the maximum degree of extension of the rod out of the tube relative to the body of the iron.

4,577,425

INFORMATION STORAGE APPARATUS

Dwight R. Foster, and Diane Foster, both of Budd Lake, N.J., assignors to Life Key Corporation, Budd Lake, N.J.

Filed Dec. 16, 1983, Ser. No. 561,952
Int. Cl.[4] G09F 3/18
U.S. Cl. 40—19 **10 Claims**



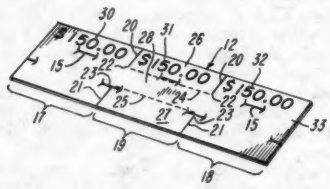
1. An information cartridge comprising, a transparent generally semiconductor male member having a supporting surface formed on the diametrical surface thereof, a protective window formed in the semicircular surface opposite to said supporting surface and threading formed on one of said semicircular ends, a transparent curved female member having a face that matches said diametrical surface, said matching face having a recess that mates with said supporting surface, a protective window formed on said curved female surface opposite to said recess, and threading formed on one of said female member ends, and a microfiche chip in said recess between said recess and said supporting surface and supported thereby.

4,577,426

COMPOSITE LABEL WEB

William A. Jenkins, Englewood, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Dec. 21, 1984, Ser. No. 684,761
Int. Cl.[4] G09F 3/10
U.S. Cl. 40—21 R **8 Claims**



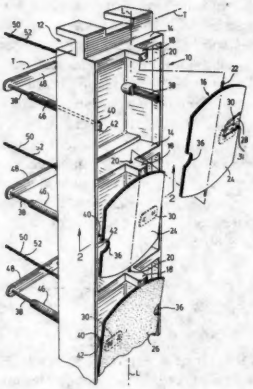
1. A composite label web, comprising: a longitudinally extending carrier web, a series of labels having one side free of adhesive and the other side releasably adhered by pressure sensitive adhesive to the carrier web, each label having longitudinally spaced lateral cuts defining a central portion with at least one lateral tab and a pair of end portions, the central portion being disposed between the end portions, the tab being laterally foldable so that the adhesive on the tab can be adhered to a laterally adjacent part of the central portion and no adhesive on the central portion is exposed, and wherein the central portion can be wrapped about an article and the end portions brought into contact at their adhesive faces to provide a tag.

4,577,427

DISPLAY

John Browne, Georgetown, Canada, assignor to Nei Canada Limited, Toronto, Canada

Filed May 14, 1984, Ser. No. 609,749
Int. Cl.[4] G09F 9/00
U.S. Cl. 40—449 **7 Claims**



1. Display or indicator device comprising: a plurality of pivotally mounted discs contrastingly coloured on opposite sides each carrying a permanent magnet defining a magnetic axis transverse to the pivot axis, magnetic field forming means exterior to the disc and arranged to provide a selectably reversible field causing rotation of the disc about the pivot axis to cause the display of one or of the other face of the disc in a predetermined viewing direction, characterized by:

a frame designed to pivotally mount a row of such discs,

the pivotal axis for each element being substantially contained in a plane parallel to said viewing direction and parallel the longitudinal direction of said row,

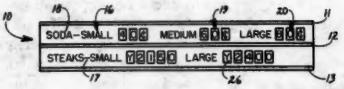
each said pivotal axis being inclined at substantially the same relative angle to the longitudinal direction of said row, said relative angle being of the order of 3°–10°.

4,577,428

DISPLAY DEVICE WITH MOVABLE TAPE ASSEMBLIES

Charles E. Trame, Mequon, Wis., assignor to Everbrite Electric Signs, Inc., South Milwaukee, Wis.

Continuation-in-part of Ser. No. 508,015, Jun. 27, 1983, abandoned. This application Jul. 18, 1984, Ser. No. 631,932
Int. Cl.[4] G09F 11/18
U.S. Cl. 40—518 **15 Claims**



1. A device for selecting and displaying indicia that are on longitudinally movable tapes, said device comprising:

a generally planar panel having front and rear sides and at least a pair of parallel track means on the rear side, said panel having an elongated aperture between the track means,

an elongated planar strip for being mounted over said aperture on the front side of said panel and said strip having a plurality of windows through which indicia may be viewed,

a generally channel-shaped tape carrier having a front platen portion on which said tape is overlaid for said indicia to be presented in the aperture, said carrier having leg portions integral with and extending rearwardly from said platen portion in spaced relationship, said carrier being comprised of a sufficiently resilient material for allowing said leg portions to be forcibly flexed toward each other to contract said carrier and thereby permit it to be inserted between said track means for it to expand when the force is relieved so as to juxtapose said platen portion to said aperture, and

divider members engageable with said tape carrier from its front side and having guide portions that overlay said platen portion in spaced relationship to thereby define laterally spaced apart channels through which the laterally opposite edges of the tapes pass whereby they are retained in proximity with said platen portion and are guided for longitudinal movement.

4,577,429

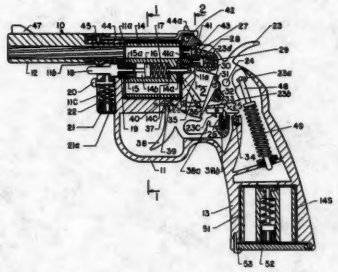
FASTENING MEANS FOR A REMOVABLE REVOLVER CYLINDER

Shimon Waiser, P.O. Box 360, Midwood Station, Brooklyn, N.Y. 11230

Continuation-in-part of Ser. No. 387,166, Jun. 10, 1982, abandoned. This application Dec. 10, 1984, Ser. No. 680,320

Int. Cl.[4] F41C *1/00*

U.S. Cl. 42—59 **4 Claims**



1. In a revolver having a frame, a handle, a barrel extending forwardly of the frame, a trigger, a cartridge firing hammer, an indexible and changeable cartridge cylinder located in a recess of the frame, said cylinder having a first and a second end and an axis of symmetry, means movably fastening said cylinder in said recess of the frame, the improvement comprising:

(a) the changeable cartridge cylinder having an elongated cylinder chamber which has an axis of symmetry coinciding with the axis of symmetry of the cartridge cylinder, said chamber shut from the front and from the rear by two end walls at least one of which is detachable, each of said walls having a through bore with a diameter smaller than the diameter of said cylindrical chamber and having an axis of symmetry coinciding with the axis of symmetry of said cylindrical chamber of the cylinder,

(b) a displaceable member having a first and a second end and a flange and disposed within said cylindrical chamber and said two bores, said displaceable member having a length at least approximately equal to the length of the cylinder,

(c) biasing means interposed between the displaceable member flange and one of said end walls of the cylindrical chamber to urge the displaceable member toward an initial position when the displaceable member is not under the action of said cylinder fastening means,

the frame characterized in that:

(1) it has at least one cavity in which is disposed said cylinder fastening means that is adjacent the first end of the cylinder,

(2) it has a hole adjacent the second end of the cylinder to receive the second end of the displaceable member when the displaceable member is pressed by the cylinder fastening means,

said cylinder fastening means consisting of:

(1) pushing means having an end which is located adjacent one of said bores in the end walls of said cylinder chamber of the cylinder, to be pushed into said bore, to fasten the cylinder in said recess of the frame,

(2) said end of the pushing means entering into the bore in the end wall of the cylindrical chamber and pressing the first end of the displaceable member thereby pushing the second end of the displaceable member into said hole in the frame when the cylinder is fastened in said recess of the frame.

4,577,430

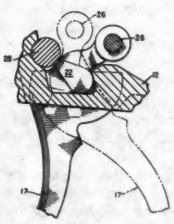
TRIGGER AND SPRING MOUNT MECHANISM

William B. Ruger, Croydon, N.H., and Lawrence L. Larson, Branford, Conn., assignors to Sturm, Ruger & Company, Inc., Southport, Conn.

Filed Jun. 25, 1984, Ser. No. 624,181

Int. Cl.[4] F41C *19/00*

U.S. Cl. 42—69 R **3 Claims**



1. In a firearm having a trigger mounted for movement therein the improvement comprising

(a) a trigger body including a finger grip section, a central trigger section and a trigger arm engaging section;

(b) a bearing cam positioned on the trigger body;

(c) a recess in the firearm frame for receiving the bearing cam; the recess including two substantially planar surfaces whose planes intersect; and

(d) arcuate retaining means adjacent the recess for preventing the bearing cam from moving out of the recess whereby the trigger body is pivotable about its bearing cam which cam is movable against the arcuate retaining means and the recess planar surfaces.

4,577,431

WEAR RESISTANT GUN BARREL AND METHOD OF FORMING

Paul A. Siemers, Clifton Park; Robert W. Kopp, Ballston Lake; Melvin R. Jackson, Schenectady, all of N.Y.; Steven R. Duke, Williston, Vt.; David P. Perrin, Charlotte, Vt., and Ying H. Liu, South Burlington, Vt., assignors to General Electric Company, Schenectady, N.Y.

Filed May 2, 1984, Ser. No. 606,110
Int. Cl.[4] F41C *21/02*; B05D *1/08*
U.S. Cl. 42—76 A **7 Claims**

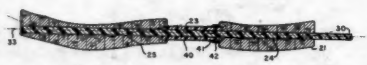
1. A composite gun barrel comprising,
an inner liner of a refractory metal,
a transition layer of said refractory metal and a jacket metal,
said transition layer being bonded to said liner,
an outer jacket of structural metal bonded to said transition layer,
said liner, transition layer and jacket being intimately metallurgically bonded together.

4,577,432

FISHING ROD HANDLE

John E. Brackett, Minneapolis, Minn., and Larry J. Dahlberg, Grantsburg, Wis., assignors to Fishing Designs, Inc., Minneapolis, Minn.

Continuation of Ser. No. 302,634, Sep. 15, 1981. This application May 15, 1984, Ser. No. 610,609
Int. Cl.[4] A01K *87/00*
U.S. Cl. 43—23 **15 Claims**



1. An improved fishing rod handle comprising:
an elongated handle having a butt grip segment on the rear end thereof;
a rod receiving hole extending generally longitudinally substantially through the length of said handle, the longitudinal, central axis of said butt grip segment being offset from the longitudinal, central axis of said hole, the central axis of said butt grip segment being in the form of a helix transcribed about the longitudinal, central axis of said rod receiving hole;
said handle further comprises a reel seat segment to receive a reel on said handle forwardly of said butt grip segment; and
said rod receiving hole extends longitudinally completely through said reel seat segment as well as through said butt grip segment of said handle for receiving a fishing rod therein.

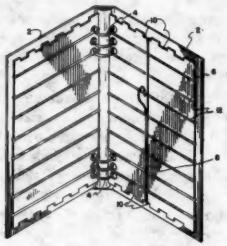
4,577,433

SNELLED HOOK, FLY, AND LURE HOLDER

Earl C. Jones, P.O. Box 123, Horseshoe Bend, Id. 83629

Filed Apr. 21, 1982, Ser. No. 362,231
Int. Cl.[4] A01K *97/06*
U.S. Cl. 43—57.2 **11 Claims**

1. A compact and convenient fishing lure and leader holder comprising:
a substantially flat rectangular plate having a multiplicity of corresponding notches located along two opposite edges; and
a series of appropriately spaced rubber bands wrapped around said plate substantially parallel to the notched edges, whereby fishing snells may be wrapped around the plate through the corresponding notches and hooks and



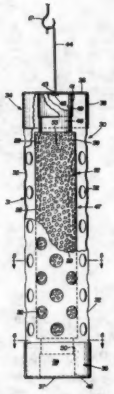
loose ends attached to or tucked under the rubber bands, thereby securing snelled lures to the plate.

4,577,434

FLYPAPER TRAP

Mitchell F. Davis, 1430 Hickory, Atwater, Ohio 44201

Continuation-in-part of Ser. No. 620,818, Jun. 15, 1984, abandoned. This application Mar. 18, 1985, Ser. No. 712,845
Int. Cl.[4] A01M *1/14*
U.S. Cl. 43—115 **12 Claims**

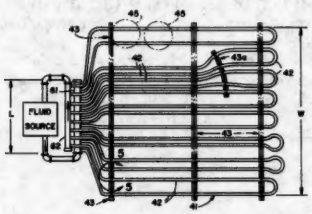


1. A flypaper trap including:
(a) a canister having a hollow interior and formed with a plurality of holes providing access into said interior;
(b) a pair of end caps mounted on opposite ends of the canister; and
(c) flypaper including a coating of a viscous tackifier material and a metalized prismatic material mounted within the interior of the canister, with said prismatic reflective material attracting insects into the canister interior through the canister holes for capture of the insects by the viscous tackifier material.

4,577,435
MICRO-CLIMATE TEMPERATURE CONTROL APPARATUS

Edward A. Springer, and Ronald D. Smith, both of 611 Mountain View Ave., Petaluma, Calif. 94952

Continuation-in-part of Ser. No. 293,681, Aug. 17, 1981, Pat. No. 4,411,101. This application Oct. 24, 1983, Ser. No. 545,072
Int. Cl.[4] A01G *13/00*
U.S. Cl. 47—2 10 Claims



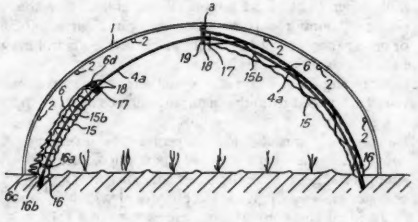
1. In a micro-climate temperature control apparatus for heating or cooling of plants including input manifold means, outlet manifold means, and an array of a plurality of heat transfer fluid conveying tubes each coupled to said input manifold means and said outlet manifold means for the flow of a heat transfer fluid therethrough, said tubes being formed of a flexible seif-supporting plastic material, adjacent tubes in said array being relatively spaced apart and said tubes being positioned adjacent to growing plants, and said tubes being independently movable over substantially the entire lengths thereof, the improvement in said micro-climate temperature control apparatus comprising:

elongated securement strip formed with a plurality of side-by-side tube receiving and retaining notches formed for and having said tubes removably mounted in press-fit relation in said notches.

4,577,436
DEVICE FOR OPENING OUT AND FOLDING BACK ONE OR MORE THERMAL SCREENS INSIDE A HOTHOUSE

Yves H. Dalle, Treémollier - Les Granettes, 13100 -Aix-en-Provence, France

Filed Dec. 14, 1982, Ser. No. 449,676
Claims priority, application France, Dec. 18, 1981, 81 24035; Feb. 22, 1982, 82 02990; Jul. 13, 1982, 82 12430
Int. Cl.[4] A01G *9/22*
U.S. Cl. 47—17 19 Claims

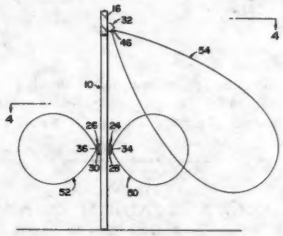


1. A device for unfolding and for folding back at least one thermal screen inside a structure having a roof with a center, such as a hothouse, said device comprising: a plurality of hoops arranged at spaced intervals inside said structure, each hoop being formed of a tube having an upper end connected to said center inside said structure, and a lower end supported on the ground, a plurality of extensible sleeves, at least some of said hoops being surrounded by one each of said sleeves, each sleeve being an air chamber comprising a first end fixed at the lower end of the respective hoop and a second, movable end comprising a piston having a perforated center and slidable over the respective hoop, said screen having one end fixed to said lower ends of at least some of said plurality of hoops and another end fixed to said piston, said air chambers have helical reinforcements placed inside said chambers, and means for blowing air into said air chambers adjacent there lower ends to thereby cause displacement of the pistons and unfolding of the screen.

4,577,437
AUTOMATIC DOOR OBJECT SENSING SYSTEM

Daniel C. Gionet, and Harry V. Nguyen, both of St. Petersburg, Fla., assignors to Lanson Electronics, Inc., Pinellas Park, Fla.

Filed Nov. 26, 1984, Ser. No. 675,004
Int. Cl.[4] E05F *15/20*
U.S. Cl. 49—25 14 Claims



1. An automatic swing door structure comprising a door, adapted to be mounted in the doorway of a support structure for swing opening relative thereto, a motion detector fixedly mounted for projecting a motion detecting beam over a path within the door width and a few feet forward of the door on the approach side thereof, a motion detector fixedly mounted on the approach side of the door for projecting a motion detecting beam over a narrower and shorter path, forward of the approach side of the door, than the first beam, a motion detector fixedly mounted on the swing side of the door for projecting a motion directing beam over a path in size similar to the second beam, outwardly of the swing side of the door, and motor means operated by the motion detecting means when the beams are intercepted by an object.

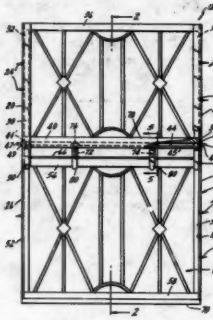
4,577,438
SECURITY WINDOW

Antonio O. Santiago, 6865 Michigan Ave., Detroit, Mich. 48210

Filed Aug. 13, 1984, Ser. No. 639,729
Int. Cl.[4] E06B *3/68*
U.S. Cl. 49—57 7 Claims

1. A security unit for a window opening in a building comprising a security panel, means for supporting said panel in said window opening for sliding movement from an installed position in which one edge of said panel is received in a channel to a second position in which said panel is withdrawn from said channel and may be removed or opened, and selectively operable means for either locking said panel in installed position by preventing sliding movement thereof to said second position or for unlocking said panel by permitting such sliding movement comprising means providing a track adjacent to the opposite edge of said panel, a plurality of pins independently slidably mounted on said track and extending toward and terminating in opposed relation to said opposite edge of said panel in the installed position thereof to prevent movement of said panel from said installed to said second position, means along said opposite edge of said panel providing a plurality of spaced, relatively deep openings capable of receiving said respective pins so that when the pins are aligned with said openings said panel may be moved from said installed to said second position

because said pins will enter said openings and not interfere with such movement, whereby said panel may be removed or opened, and opening means along said opposite edge adapted



to receive said pins but of insufficient depth to permit said panel to be moved far enough toward said second position to clear said channel, whereby the panel remains locked in installed position.

4,577,439

WINDOW REGULATOR MECHANISM

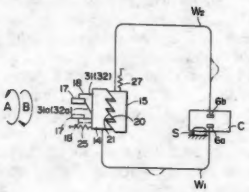
Shojiro Seki, Hadano, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jun. 20, 1984, Ser. No. 622,454

Claims priority, application Japan, Jun. 25, 1983, 58-113635

Int. Cl.⁴ E05F *11/48*

U.S. Cl. 49—352 **6 Claims**



1. A window regulator for operating a slidable window panel, comprising a carrier secured on said window panel and mounted for movement along a guide member, a first wire having one end mounted on said carrier, a second wire having one end mounted on said carrier, and a drive unit connected to the other ends of said first and second wires for winding one of said first and second wires and unwinding the other wire to move said carrier in one direction, said drive unit including:

(a) a drive drum rotatably and slidably mounted on a shaft for winding and unwinding said first wire;

(b) a driven drum rotatably and slidably mounted on said shaft adjacent said drive drum;

(c) a first ratchet mounted on said drive drum, said first ratchet having ratchet teeth that face in a direction to unwind said first wire;

(d) a second ratchet mounted on said driven drum, said second ratchet having ratchet teeth facing in a direction to unwind said second wire for engagement with said ratchet teeth of said first ratchet;

(e) a winding spring mounted in said drive unit for urging said driven drum in a direction to wind said second wire on said driven drum;

(f) resilient means for urging one of said drive and driven drums to bring said first and second ratchets into resilient engagement;

(g) a drive member secured on said shaft for rotation in unison therewith to rotate said drive drum in the same direction as said shaft rotates; and

(h) means, responsive to rotation of said drive member in a direction to cause said drive drum to wind said first wire for preventing movement of said drive and driven drums along said shaft to hold said second ratchet in mesh engagement with said first ratchet.

4,577,440

CLAMPING DEVICE FOR A GRINDING RING

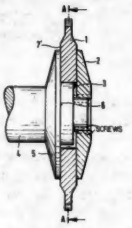
Erwin Junker, Talstrasse 78, D 7611 Nordrach/Baden, Fed. Rep. of Germany

Filed Jun. 13, 1984, Ser. No. 620,353

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1983, 3322258; Feb. 16, 1984, 3405556

Int. Cl.⁴ B24B *41/04*

U.S. Cl. 51—168 **15 Claims**



1. A grinding apparatus, for utilization on a grinding machine in which solid material is removed from a surface of a solid body by the rotary motion of a grinding disk, which comprises:

(a) a rotatable rectilinear driving shaft;

(b) a support flange, said support flange being mounted to said driving shaft and having an outer flat ring-shaped planar clamping surface, said clamping surface being oriented at a substantially right angle to the central longitudinal axis of said driving shaft;

(c) a clamping flange, said clamping flange being juxtaposed with and spaced from the clamping surface of said support flange;

(d) a generally circular grinding ring, said grinding ring being interposed between said clamping flange and said support flange, at least the outer edge of said grinding ring being composed of an abrasive material which is capable of grinding and comminuting the surface of a solid body, by the rotary motion of said grinding ring, while concomitantly contiguously contacting said surface of said solid body with said abrasive material, said grinding ring having a central generally circular borehole, one face of said grinding ring being mounted on said clamping surface of said support flange, so that said grinding ring is oriented at a substantially right angle to said central longitudinal axis of said drive shaft;

(e) a generally circular supporting portion means, said supporting portion means constituting an outer portion of said

support flange at or adjacent the terminal end of said driving shaft, and extending centrally between said clamping flange and said clamping surface of said support flange;

(f) a first interacting guiding means, said first guiding means being disposed on the outer annular surface of said supporting portion means;

(g) a second interacting guiding means, said second guiding means being disposed on the inner surface of said borehole of said grinding ring, so that said first and second guiding means cooperate and interact to allow and permit good balancing and faultless whirling of said grinding ring, when centrally mounted and clamped between said clamping flange and said support flange, with balanced spinning and rotation of said grinding ring in exactly circular motion; and

(h) means to urge said clamping flange towards said support flange, so that said grinding ring is restrained and revolved in rotary motion about said central longitudinal axis of said driving shaft, when said driving shaft is rotated, said grinding ring being thereby detachably attached and fastened to said driving shaft.

4,577,441

MULTIPLE-STATION CENTRIFUGAL BLASTING APPARATUS

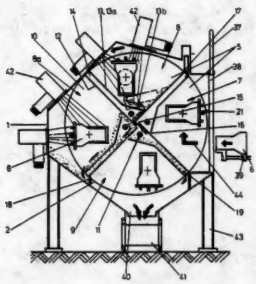
Peter Brenner, Schaffhausen, Switzerland, assignor to Georg Fischer Aktiengesellschaft, Scaffhausen, Switzerland

Filed Mar. 9, 1984, Ser. No. 588,145

Claims priority, application Switzerland, Mar. 21, 1983, 1519/83

Int. Cl.⁴ B24C *3/18*

U.S. Cl. 51—419 **10 Claims**



1. Blasting apparatus for passing workpieces through a plurality of process stations comprising:

conveyor drum means having a generally cylindrical configuration defining a plurality of receiving chambers each adapted to receive therein workpieces to be processed;

means for rotating said conveyor drum means about a central axis thereof for passing said receiving chambers through a plurality of process stations including at least one blasting process station and a loading and unloading station, said blasting process station including means for directing a blasting medium at said workpieces within said receiving chambers; and

wall means extending radially between each of said receiving chambers defining in said conveyor drum means between each of said receiving chambers thereof flow off channels extending radially of said conveyor drum means from the center to the outer circumference thereof for enabling outflow of said blasting medium;

said wall means having radially innermost ends defining in a labyrinthine flow pattern at the center of said conveyor drum means flow paths through which each of said flow off channels is connected with said receiving chambers.

4,577,442

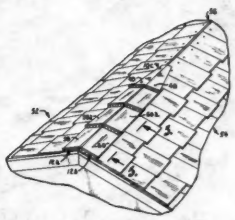
RIDGE ROW CLAMP

Ernest F. Callaway, 5413 Hedges, Raytown, Mo. 64133

Filed Jul. 18, 1983, Ser. No. 514,547

Int. Cl.⁴ E04D *3/40*

U.S. Cl. 52—57 **7 Claims**



1. For use in shingling first and second opposed surfaces forming a ridge of a roof, a shingle mount apparatus comprising the combination of:

first and second roofing shingles;

a sheet member bendable about an imaginary longitudinal axis to present an edge having first and second plates sloping therefrom;

fastener means on said sheet and movable therewith to present first and second fastener elements on said first and second plates attaching a repective shingle atop said respective plate, each fastener element comprising:

an upstanding support member generally normal to said sheet and lying generally perpendicular to said ridge upon affixation of said sheet to said ridge; and

a lip extending from said upstanding support and above said plate and lying generally perpendicular to said ridge upon said affixation, each lip clamping a shingle to said associated plate upon insertion of an edge of said shingle therebetween; and

means for affixing said sheet to said roof with said sheet edge defining the edge of said roof ridge and said first and second plates respectively overlying said opposed surfaces of said roof forming said ridge, whereupon said attachment of said shingle to said affixed plate by said fastener element presents a shingling of a segment of said surface underlying said respective plate and forming said roof ridge.

4,577,443

METALLIC SHEATH FOR POSTTENSIONING METHOD

Toshiyuki Kitta, Omiya; Wataru Abe, Hiratsuka, and Tadaaki Takase, Fujisawa, all of Japan, assignors to Oiles Industry Co., Ltd., Tokyo, Japan

Filed Nov. 12, 1982, Ser. No. 441,080

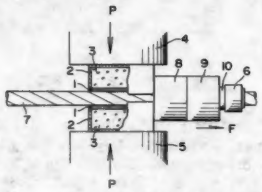
Claims priority, application Japan, Nov. 13, 1981, 56-181187

Int. Cl.⁴ E04C *5/12*

U.S. Cl. 52—230 **8 Claims**

1. A metallic sheath for use in a posttensioning method, said sheath having an inner peripheral surface thereof coated with

a solid lubricating coating comprising 20–60 vol % of polytetrafluoroethylene, 10–50 vol % of a soft metal, a metal sulfide



or a mixture thereof, and 30–70 vol % of styrenated alkyd as a binder.

4,577,444

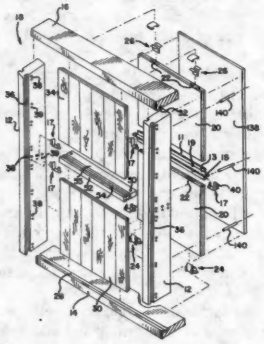
CHANGEABLE WALL PANEL STRUCTURE

Dewey S. C. Sanderson, 3901 E. 26th Ave., Denver, Colo. 80205

Filed Sep. 2, 1983, Ser. No. 529,123

Int. Cl.[4] B44F *7/00*

U.S. Cl. 52—311 **16 Claims**



1. A changeable wall structure comprising a frame including upper, lower and side members, at least one inner panel, a first mounting means connected to said frame for removably holding said inner panel, said first mounting means comprising a bracket including a base plate secured to the lower member of the frame, and a member removably connected to and extending upwardly from said base plate for supporting the lower edge of said inner panel, at least two outer panels mounted one above the other, and second mounting means connected to said frame for removably holding said outer panels to conceal said inner panel, said second mounting means including a bracket secured to each side member of the frame at upper, lower or intermediate levels, and at least one shelf supported at each end by said brackets, grooves defined by the shelf and extending along its upper and lower surfaces for receiving the bottom and top edges, respectively, of said outer panels, said inner and outer panels being removably held so that each panel substantially fills the space between the side members of the frame and wherein, upon removal of an outer panel, the inner panel is exposed to view.

4,577,445

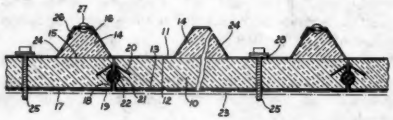
INSULATION PANEL ASSEMBLY FOR USE IN THE ROOFING AND/OR THE CLADDING OF WALLS OF BUILDINGS

William F. Price, Rhu, United Kingdom, assignor to Ecometal Limited, Glasgow, United Kingdom

Filed Aug. 28, 1984, Ser. No. 645,412

Int. Cl.[4] E04B *1/62, 1/74*

U.S. Cl. 52—403 **5 Claims**



1. In an insulation panel assembly for use in the roofing and/or the cladding walls of buildings, comprising an elongate panel having two major faces and two longitudinal side edge faces, and two elongate metal sections, each comprising a web engaging on one side thereof one of the side edge faces, a first flange at one longitudinal edge of the web and extending at right angles to the web from one side thereof, a second flange at the other longitudinal edge of the web for the extending at an inclination to the web from the one side thereof and towards the first flange, and a channel in the web opening to the other side of the web for receiving a vapour seal, the improvement wherein the panel is preformed from mineral fibres having a density of not less than 180 kg/m^3, the first flange of each section is fitted flush against one of the major faces of the panel, the second flange is fitted into a correspondingly inclined first groove extending the full length of the panel and cut into the respective side edge face of the panel intermediate the major faces thereof, and the channel is fitted into a corresponding second groove cut into the respective side edge face of the panel intermediate the inclined first groove and the one major face of the panel exclusively by sliding the section along the respective side edge of the panel, and a metal sheet is placed loosely on the other major face of the panel.

4,577,446

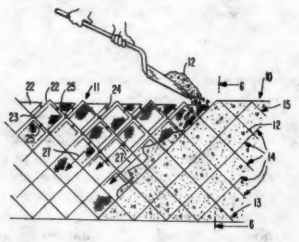
MACHINE WALL

Alexander Stefan, 3120 S. Highland Dr., Las Vegas, Nev. 89109

Filed Mar. 8, 1984, Ser. No. 587,462

Int. Cl.[4] E04F *15/14*

U.S. Cl. 52—425 **1 Claim**



1. A machine wall, comprising, in combination, a framework and a quantity of concrete for being poured into said framework, said framework comprising a plurality of horizontal courses laid one upon another and fastened together, each said course comprising a strip of bent up, expanded metal screening bent into a zig-zag configuration by right angle, alternate upwardly and downwardly bends and forming a plurality of same-sized flat panels between said bends, said courses being wired together at adjacent said bends to form said framework, all said panels of said courses extending angularly upwardly

and forming a honey-combed structure for said framework, and some of said panels including a flap die cut in a center thereof, said flap being outwardly bent up at right angle, said bent up flaps together forming a vertical, general wall on one side of said framework, and means for said concrete being poured inside said honey-combed structure.

4,577,447

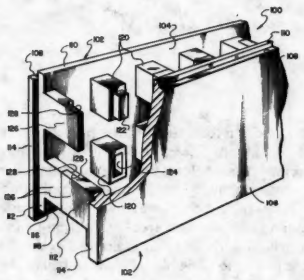
CONSTRUCTION BLOCK

William E. Doran, 524 Via Almar, Palos Verdes Estates, Calif. 90274

Continuation-in-part of Ser. No. 310,797, Oct. 13, 1981. This application Jun. 10, 1983, Ser. No. 503,358

Int. Cl.[4] E04B *1/12, 2/00;* E04C *1/04*

U.S. Cl. 52—571 3 Claims



1. A construction building block formed of a lightweight, molded plastic material comprising:

a pair of half members, one of said half members being located in a reversed facing relationship relative to the other said half member forming therebetween an opening assembly, said half members being identical, said half members forming a front wall and a back wall and a top surface and a bottom surface, said front wall being connected to said back wall by a pair of spaced apart side walls, said top surface and said bottom surface and said side walls forming a peripheral edge of said construction building block; and

first interlocking means connected to said back wall, said first interlocking means of said one half member interlockingly matingly engaging with said first interlocking means of the other said half member, said first interlocking means being composed of a plurality of upstanding members, said first interlocking means being located within said opening assembly, said upstanding members comprising a plurality of connected pairs, each said connected pair including a polygonal shaped male member and a polygonal shaped female member with the said male member adhesively matingly engaging with its respective said female member, said opening assembly forming a plurality of openings between said connected pairs of said upstanding members, said openings extending between said top surface and said bottom surface, upon said building block being located in a vertically orientated stacked relationship said openings between vertically joined said building blocks forming a plurality of separate openings adapted to accommodate a quantity of poured masonry cement which when hardened provides the necessary strength for a wall structure produced by said building blocks.

4,577,448

FLOORS

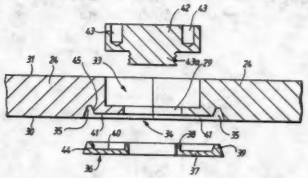
David Howorth, Bacup, England, assignor to The British Picker Company, Ltd., Todmorden, England

Filed Jun. 3, 1982, Ser. No. 384,743

Claims priority, application United Kingdom, Jun. 17, 1981, 8118563

Int. Cl.[4] E04C *1/30;* E04B *1/00;* F16B *1/00;* E01C *5/20*

U.S. Cl. 52—584 9 Claims



1. An artificial ice skating floor comprising:

(a) a plurality of panels of high molecular weight polyethylene arranged edge to edge to provide a substantially continuous planar skating surface;

(b) notches in the edges of the panels which co-operate with the notches in the edges of adjacent panels to define a plurality of bores extending vertically through the skating surface from the lower face of the skating surface to the upper face of the skating surface;

(c) a set of first rebates in the upper faces of the panels around the said notches, and said first rebates of the panels co-operating with the said first rebates of adjacent panels so that an upper counterbore is defined around the upper end of each said bore;

(d) a set of second rebates in the lower faces of the panels around the said notches, the said second rebates of the panels co-operating with the said second rebates of adjacent panels so that a lower counterbore is defined around the lower end of each said bore;

(e) a set of grooves in the lower faces of the panels;

(f) a set of flanged first locating members each of which engages in one of the said lower counterbores with the flanged portion of the first locating member engaging in the groove of the adjacent panels which define the said one lower counterbore thus preventing the panels from moving apart in the horizontal direction;

(g) and a set of second locating members each of which engages in one of the said upper counterbores and is screw-threadedly interconnected with one of said first locating members through the said bore associated with the said upper counterbore, sandwiching the panels between the first and second locating members so that the panels cannot move apart in the vertical direction.

4,577,449

PREFABRICATED STRUCTURAL CONNECTOR FOR STEEL-FRAME BUILDINGS

Aldo Celli, Via Jacopo Palma 9, 20146 Milano, Italy

Filed Nov. 16, 1983, Ser. No. 555,365

Int. Cl.[4] E04C *3/30*

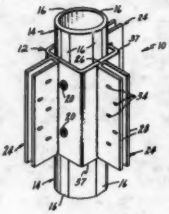
U.S. Cl. 52—721 10 Claims

1. A prefabricated steel-frame building structural connector for interconnecting two vertical column members with each other end-to-end and with at least one horizontal beam member having a central web, said vertical column members having predetermined identical substantially square tubular cross sections, said structural connector comprising

a central hollow tubular portion having a central axis, axially spaced flat ends perpendicular to said axis, a substantially square cross section identical to said predetermined column cross section, and four flat outer surfaces facing laterally outwardly of said axis,

first and second hollow substantially cylindrical tubular end projections joined to said central portion and projecting from said ends of said central portion in opposite directions coaxially with said central portion,

each said cylindrical end projection including four perpendicularly spaced outwardly facing flat surface portions disposed in diametrically opposed pairs extending throughout the length of the associated end projection and diametrically spaced from each other by a distance substantially equal to separation between opposed inner surfaces of said predetermined substantially square cross



section, such that said cylindrical projections are constructed for close telescopic insertion into column members with said columns seated against said spaced ends of said central portions so as to align the column members axially and rotationally with said central portion and with each other, and

at least one mounting bracket permanently joined to one flat outer surface of said central portion and having a flange projecting laterally outwardly from said one surface parallel to said axis, said flange being structured for connection to the web of a beam member.

4,577,450

WATERPROOF FLOOR PANEL FASTENING SYSTEM, ACCESSIBLE FROM ABOVE

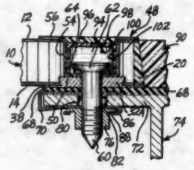
David T. Large, Everett, Wash., assignor to The Boeing Company, Seattle, Wash.

PCT No. PCT/US83/00889, § 371 Date Jun. 6, 1983, § 102(e) Date Jun. 6, 1983, PCT Pub. No. WO84/04948, PCT Pub. Date Dec. 20, 1984

PCT Filed Jun. 6, 1983, Ser. No. 515,712

Int. Cl.⁴ E04C *5/16*

U.S. Cl. 52—787 **31 Claims**



1. A fastener assembly for floor panels which permits floor panel removal and inspection from above, comprising:

an upwardly open first cup;

said first cup having a central hole in its bottom and having a fastening bolt extending therethrough;

an upper second cup fitted in the opening of the upwardly open first cup;

the upper second cup having a central portion forming a wall transverse to the bolt axis and spaced above on the bolt head; and

a hardened seal extending across and above said transverse wall of said upper cup and forming a seal across the opening of the upwardly open first cup.

4,577,451

DEVICE FOR DETECTING THE PRESENCE OF AN ARTICLE IN THE RECESSES OF THE FEEDING DISC OF A WRAPPING MACHINE

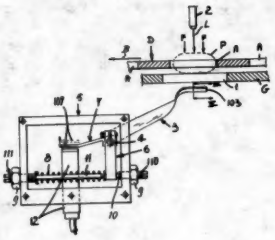
Sandro Salicini, Bologna, Italy, assignor to Carle & Montanari S.p.A., Bologna, Italy

Filed May 22, 1984, Ser. No. 612,833

Claims priority, application Italy, May 23, 1983, 12529 A/83

Int. Cl.⁴ B65B *57/10*

U.S. Cl. 53—58 **4 Claims**



1. Detecting device for detecting the presence or absence of an article in recesses of a feeding disc of a wrapping machine for articles, comprising at least one nozzle arranged at one side of said disc and emitting a continuous or a pulsating jet of air against a portion of the disc containing said recesses so that said jet is intercepted by a said article if present in a said recess, and passes through said recess and said disc in the absence of a said article, at least one movable target member being provided opposite said nozzle at a side opposite said disc and at a suitable distance therefrom, said target member being associated with sensor means adapted to issue different signals depending upon whether or not said target member is displaced by said jet of air and, therefore, depending upon whether an article is absent or present in a said recess, said nozzle being arranged above said feeding disc and at a suitable distance therefrom so as to avoid any contact with said article, a fixed guide member being provided below said feeding disc and in alignment with said recesses for supporting a said article housed in a said recess, said guide member having at least one opening axially aligned with said nozzle and said target member to permit the passage therethrough of said jet of air emitted by said nozzle, said target member being in the form of a shovel and constituting the end portion of a lever which is keyed on a shaft rotatably mounted in a housing enclosing said sensor means, said shaft having keyed thereon a control lever whose distance from said sensor means is controlled by a spring means, said control lever also being displaced with respect to said sensor means when said shovel-shaped target is displaced by said jet of air, thereby causing said sensor means to issue a different signal.

4,577,452

APPARATUS FOR LOADING AND UNLOADING A FILM CASSETTE, IN PARTICULAR AN X-RAY FILM CASSETTE

Peter Hösel, and Günther Schindlbeck, both of Munich, Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Aug. 29, 1983, Ser. No. 527,308

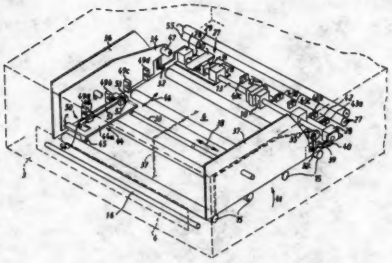
Claims priority, application Fed. Rep. of Germany, Aug. 30, 1982, 3232148

Int. Cl.⁴ B65B *5/08*

U.S. Cl. 53—266 R **15 Claims**

1. Apparatus for loading and unloading a film cassette, in particular an X-ray film cassette, comprising: a housing defin-

ing a compartment and including a front face having an opening to the compartment through which opening the cassette is introduced; first means for transporting the cassette from the opening into the compartment and for discharging the cassette from the compartment through the opening; means for unlocking the cassette at an unlocking station; second means for transporting the unlocked cassette to a removing station in which the film is removed from the cassette and subsequently



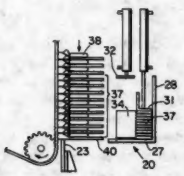
to a loading station in which the cassette is loaded with a new film; and means for removing the film from the cassette at the removing station and loading the cassette with a new film at the loading station, the unlocking means including at least one rocker arranged at the rear side of the compartment and movable in a direction parallel to the length of the cassette for unlocking the cover of the latter, and at least one hook insertable into the cassette and movable in an upward direction for lifting the cover from the remaining part of the cassette.

4,577,453

METHOD OF AND APPARATUS FOR FORMING AND CARTONING MULTI-STACK ARRAYS OF COMPRESSIBLE ARTICLES

Henry H. Hofeler, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 1, 1984, Ser. No. 576,097
Int. Cl.[4] B65B *63/02*
U.S. Cl. 53—438 **8 Claims**



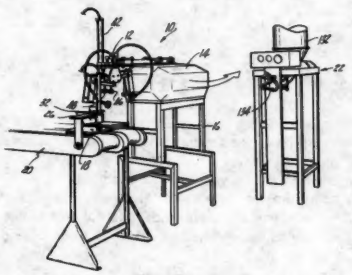
7. A method of forming and cartoning multi-stack arrays of compressible elongate articles having elongate side edges, said method comprising the steps of sequentially forming and marshalling a multi-stack array of stacks of articles with said stacks in side-by-side abutting relation by independently pushing each formed stack along a first path disposed orthogonally with respect to said elongate side edges until it is disposed in its respective position in said array being marshalled, independently compressing each of said stacks to a predetermined height prior to the next successive stack being pushed to its respective position in said array for forming an abutting stop for the next successive stack and for obivating interleaving of said articles of said next successive stack with said articles of the preceding said stack, and unitarily pushing said array into an empty carton having a height substantially equal to said predetermined height.

4,577,454

VALVE BAG PLACING MACHINE AND METHOD

Paul R. Wright, and Dale A. Hill, both of Humboldt, Iowa, assignors to Douglas & Lomason Company, Farmington Hills, Mich.

Filed May 31, 1984, Ser. No. 615,752
Int. Cl.[4] B65B *43/30*
U.S. Cl. 53—492 **24 Claims**



1. An apparatus for placing a valve bag having a valve opening, sides, and an end flap, said apparatus picking up said valve bag, opening said valve opening and placing said valve opening over a material dispensing nozzle, said apparatus comprising;

a bag clamping assembly including one or more first vacuum cups movable by a first actuator means, said first vacuum cups attachable to said end flap of said valve bag, said bag clamping assembly further including a pair of articulated arms movable by a second actuation means, said articulated arms having one or more bag engaging means attached thereto which are movable toward one another to contact opposite sides of said valve bag, said bag engaging means further movable away from said first vacuum cups thereby opening said valve opening, and

a movable arm for positioning said bag clamping assembly in contact with said valve bag, rotating said valve bag and translating said bag such that said bag valve opening is placed over said material dispensing nozzle.

4,577,455

GRASS CUTTING HEIGHT INDICATOR FOR LAWN MOWER AND TRACTOR COMBINATION

Akira Amano, Tokyo, and Kazuhiko Sasaki, Saitama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 30, 1984, Ser. No. 676,907
Claims priority, application Japan, Nov. 30, 1983, 58-184750
Int. Cl.[4] A01D *34/54*
U.S. Cl. 56—17.1 **5 Claims**

1. A grass cutting height indicator in a power-driven tractor having an operator's seat, comprising:

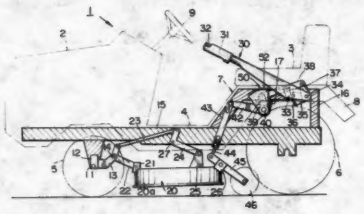
(a) a lawn mower unit suspended from a tractor frame of said tractor;

(b) an adjusting lever disposed to be pivotably supported on said tractor frame below and to the rear of said operator's seat;

(c) a link mechanism operatively connected between said adjusting lever and said lawn mower unit for adjusting the height of said lawn mower above ground in response to operation of said adjusting lever said link mechanism including a first arm pivotably supported by a first support shaft on said tractor frame and a second arm mounted on a second support shaft for angular movement with said

adjusting lever and operatively coupled to said first arm in substantially parallel relation thereto;

(d) an indicator member for indicating grass cutting heights comprising a sector-shaped plate having a center bearing fixedly supported on said first support shaft for angular movement with said support shaft and indicator means



mounted on an outer arcuate edge of said sector-shaped plate; and

(e) an indicator window defined in a tractor body at the top of the body portion next to the front side portion of the seat, and indicator member being positioned so that said indicator means has at least a portion thereof facing said indicator window.

4,577,456

MOWING MACHINE

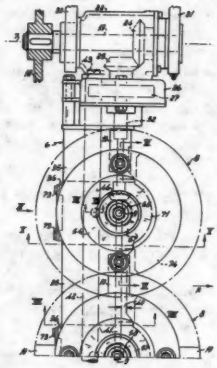
Ary van der Lely, Maasland, and Cornelis J. G. Bom, Rozenburg, both of Netherlands, assignors to C. Van Der Lely N.V., Maasland, Netherlands

Division of Ser. No. 416,047, Sep. 7, 1982, Pat. No. 4,476,666. This application Oct. 2, 1984, Ser. No. 656,881

Claims priority, application Netherlands, Sep. 10, 1981, 8104178

Int. Cl.[4] A01D *55/18*

U.S. Cl. 56—13.6 **20 Claims**



1. A mowing machine having an elongated main frame comprising a plurality of driving units with cutters along the length thereof, said cutters being rotatable about respective upwardly extending axes and driving means connected to rotate said cutters about said axes, said units having end faces which extend across a major part of their length in the usual direction of operation, a tie member securing said units in place and said tie member extending through aligned apertures of said driving units intermediate the leading and trailing edges of said frame and approximately midway of each said end face's length, said tie member being heavily loaded in tension to apply compressive force substantially centrally to said driving units in a direction transverse to the machine's usual direction of operations and form a rigid main frame that resists bending and is uniformally loaded.

4,577,457

TREE TRIMMING APPARATUS

Spencer H. Grant, 1220 Millers Mil Rd., P.O. Box 450, Stockbridge, Ga. 30281

Continuation-in-part of Ser. No. 348,493, Feb. 12, 1982, Pat. No. 4,455,815. This application Mar. 8, 1984, Ser. No. 587,609

Int. Cl.[3] A01D *55/8*

U.S. Cl. 56—235 **8 Claims**

1. Tree trimming apparatus adapted to be manually controlled by an operator including:

a support frame;

a single ground engaging wheel rotatably mounted in said support frame and adapted to partially support said support frame on the ground so that said frame and wheel can pivot from side-to-side about the point where the wheel engages the ground;

manually engageable handle means on said support frame so that the operator can grasp said handle means to guide the tree trimming apparatus, said handle means constructed and arranged so that the operator can exert side-to-side moments of force on said trimming apparatus to control the side-to-side pivoting movement thereof about the point where the wheel engages the ground;

mast means mounted on said support frame and extending upwardly and outwardly therefrom on one side of said wheel;

cutter means mounted on said mast means to trim a tree as the operator guides the apparatus around the tree, said cutter means having a cutting plane defining a prescribed angle with respect to the plane of the wheel so that when said wheel is vertically oriented, said cutting plane defines the prescribed angle with respect to the vertical, the combined weight of said mast means and said cutter means exerting a moment of force on said apparatus tending to pivot said apparatus from side-to-side in a first direction about the point where the wheel engages the ground; and

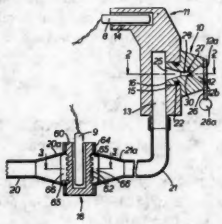
drive means mounted on said support frame on the opposite side of said wheel from said mast means and drivingly connected to said cutter means to operate same, the weight of said drive means exerting a moment of force on said apparatus tending to pivot said apparatus from side-to-side in the direction opposite said first direction about the point where the wheel engages the ground, said drive means positioned relative to said wheel so that the moment of force exerted on said apparatus by the combined weight of said mast means and said cutter means equals the moment of force exerted on said apparatus by the weight of said drive means only when said wheel is vertically oriented to provide an indication to the operator through the handle means when the wheel is vertically oriented.

4,577,458

JOINING OF YARNS BY PNEUMATIC SPLICING

Russell K. Garnsworthy, Highton, Australia, assignor to Commonwealth Scientific and Industrial Research Organization, Australia

Filed Oct. 15, 1984, Ser. No. 660,674
Claims priority, application Australia, Oct. 14, 1983, PG1861
Int. Cl.[4] B65H *69/06;* D01H *15/00*
U.S. Cl. 57—22 20 Claims



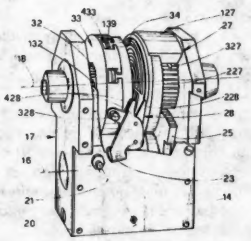
1. Apparatus for splicing fibrous yarns comprising structure having walls which define a chamber accessible to receive respective portions of the yarns and confine them adjacent one another, means to direct a gas stream into said chamber transversely to said yarn portions, and means to maintain the gas stream entering the chamber at an elevated temperature sufficient to produce an enhanced intermingling of fibres of the yarn portions which is effective to splice the yarns together.

4,577,459

PROCESS AND APPARATUS FOR MECHANICALLY SPLICING YARNS

Claudio Speranzin; Roberto Badiali, both of Pordenone, and Luciano Bertoli, Salo', all of Italy, assignors to Officine Savio S.p.A., Pordenone, Italy

Filed Nov. 3, 1982, Ser. No. 438,805
Claims priority, application Italy, Nov. 4, 1981, 83494 A/81; May 26, 1982, 83396 A/82; May 26, 1982, 83397 A/82; Sep. 13, 1982, 83447 A/82
Int. Cl.[4] B65H *69/06;* D01H *15/00*
U.S. Cl. 57—22 38 Claims



1. Procedure for splicing textile yarns mechanically whereby two yarns which are initially placed crosswise, awry or parallel to each other are first untwisted and then retwisted together utilizing two ring means comprising untwisting said yarns up to a desired value in positions of mutual noninterference, bringing together said yarns until they are substantially pressed against each other, clamping said yarn at a position lying at about the beginning of the desired taper of each remaining tail end in cooperation with said ring means so as to determine the length of said remaining tail ends, effecting a plucking-tearing action on the tails to be discharged, to obtain progressive remaining tail ends before said retwisting action, doubling and retwisting the remaining tail end by said ring means in at least two points located at least at about the ends of the splice, the action of mechanical retwisting taking place in a controlled manner from the middle of the ring means substantially up to the periphery of the same at the same time and is obtained with a mixed tangential and axial movement outwards.

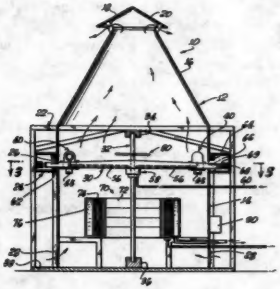
14. A splicer for splicing textile yarns comprising a frame, a single pair of coaxial rings facing each other mounted on said frame to move relative to each other and between which said yarns are frictionally acted upon to be untwisted, coaxial retwisting means positioned within said rings for frictional action on said yarn, means on said retwisting means to bring the yarns together, plucking and tearing means positioned on said frame outside of said rings, clamping means on said retwisting means and drive means mounted on said frame to operate said rings, said retwisting means and said plucking and tearing means.

4,577,460

METHOD AND APPARATUS FOR GENERATING ENERGY

Wayne S. Wirsching, 85 Gentry Way, Reno, Nev. 89502

Filed Oct. 10, 1980, Ser. No. 195,798
Int. Cl.[4] F02C *3/14*
U.S. Cl. 60—39.35 1 Claim



1. The method for converting fuel energy to mechanical or electrical energy which comprises: (1) affixing a circular disc means onto a shaft means at a point between the ends of said shaft means; (2) mounting said ends of said shaft means for rotation within bearing means; (3) affixing said bearing means to a frame means; (4) affixing at least one jet propulsion engine means onto said circular disc means proximate the outer edge of said circular disc means; (5) providing fuel to said jet propulsion engine means through a fuel conduit means; (6) placing a electromagnetic bearing means at the outer edge of said circular disc means for aiding the relieving of the pull of gravity upon said circular disc means and its associated jet propulsion engine means; (7) providing an electrical generating means at the periphery of said circular disc means in order to provide ignition energy for said jet propulsion engine means and the energy for energizing said electromagnetic bearing means; and (8) providing speed control means for controlling the rotational speed of said circular disc means.

4,577,461

SPACECRAFT OPTIMIZED ARC ROCKET

Gordon L. Cann, P.O. Box 279, Laguna Beach, Calif. 92652

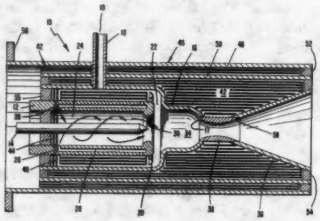
Filed Jun. 22, 1983, Ser. No. 506,876
Int. Cl.[4] F03H *1/00*
U.S. Cl. 60—203.1 23 Claims

1. A thruster for use in an extraterrestrial vehicle comprising:

(a) an outer casing;

(b) a cathode mounted within said outer casing and having an end;

(c) an anode mounted within said outer casing and spaced a predetermined distance from said cathode end, said predetermined distance defining a gap in which an arc is formed;
(d) nozzle means mounted within said outer casing, and
(e) fuel supply means for supplying propellant fuel to said thruster comprising:
(i) an inlet conduit extending through said outer casing;



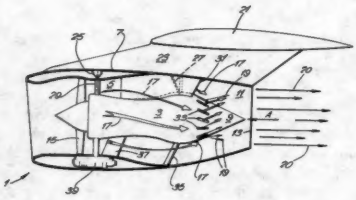
(ii) first passageway means connecting said inlet conduit with an area within said outer casing adjacent said gap,
(iii) said first passageway means including a supply conduit extending through said anode and including a portion thereof located upstream of said gap; and
(iv) second passageway means extending from said inlet conduit and bypassing said arc.

4,577,462

EXHAUST MIXING IN TURBOFAN AEROENGINES

John M. Robertson, Greenwich, Conn., assignor to Rolls-Royce Limited, London, England

Filed Oct. 26, 1984, Ser. No. 665,152
Claims priority, application United Kingdom, Nov. 8, 1983, 8329733
Int. Cl.[4] F02K *1/02*
U.S. Cl. 60—262 **11 Claims**



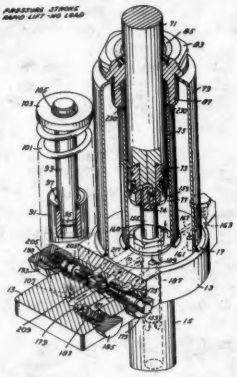
1. An improved exhaust mixing structure in a bypass gas turbine aeroengine, said aeroengine having an engine core surrounded by a bypass duct, wherein, during the operation of the aeroengine, a turbine exhaust stream is formed in the core of said engine having swirl and rearward components and a bypass airstream is formed in said bypass duct, said exhaust stream and bypass airstream being combined with each other before exit of the combined airstream from a final propulsion nozzle of said aeroengine, said exhaust mixing structure comprising:
means for dividing the turbine exhaust stream into an annular array of discrete turbine exhaust jets, each jet having (1) a rearward component of velocity, (2) a radially outward component of velocity, and (3) a tangential component of velocity, said means including a plurality of turbine exhaust ducts for conveying respective portions of the turbine exhaust stream from said engine core to thereby generate a plurality of turbine exhaust jets, said jets having an elongated shape in cross section and being oriented with the longitudinal centerlines of said cross-sections being substantially aligned with the direction of flow of said bypass stream airstream therepast, said ducts conveying said turbine exhaust stream into said bypass airstream without substantial modification to the direction of flow thereof immediately before entry of said exhaust stream into said ducts, the swirl and rearward components of velocity of the turbine exhaust streams thereby forming the tangential, radial and rearward components of velocity of said turbine exhaust jets, and
means for imparting a swirl component of velocity to said bypass airstream sufficient to balance the tangential momentum of said turbine exhaust jets, said combined bypass airstream and turbine exhaust jets having a substantially zero net swirl velocity.

4,577,463

PALLET TRUCK WITH HYDRAULIC LIFT

Tuval Kedem, Miami, Fla., assignor to Equipment Company of America, Hialeah, Fla.

Division of Ser. No. 313,411, Oct. 26, 1981, Pat. No. 4,424,885.
This application Oct. 25, 1984, Ser. No. 664,665
Int. Cl.[4] F16D *31/02*
U.S. Cl. 60—426 **8 Claims**



1. A hydraulic control system comprising a base plate forming a manifold, a lift cylinder mounted upon the base plate having therein a reciprocal rod and lift piston, and a pump cylinder mounted upon the base plate having an outlet and a reciprocal pump piston projecting therefrom;
a hydraulic control mechanism including a body depending from the base plate having an elongated bore extending axially of and communicating with said lift cylinder;
a plunger piston positioned within said body and projecting from said bore and at one end abutting said lift piston;
there being a first passage in said base plate interconnecting said pump cylinder outlet and said bore;
a reservoir mounted upon said base plate containing hydraulic fluid and having a first outlet communicating with said first passage for feeding hydraulic fluid into said pump cylinder on movement of said pump piston in one direction during its suction stroke;
first valve means within said base plate blocking pressurized hydraulic fluid from said reservoir first outlet;
movement of said pump piston in the opposite direction feeding pressurized hydraulic fluid through said first passage to said bore thereby moving said plunger piston and said lift piston and rod;
said reservoir having a second outlet;
there being a second passage in said base plate at one end communicating with said second outlet and at its other end communicating with said lift cylinder;

and a normally seated valve means within said second passage;

the movement of said lift piston and rod drawing hydraulic fluid from said reservoir through said second passage into said lift cylinder.

4,577,464

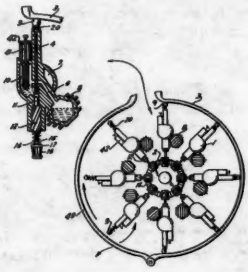
MULTIPLE POWER WHEEL ENGINE

Friedrich Weinert, 219-19 - 131st Ave., Jamaica, N.Y. 11413

Continuation-in-part of Ser. No. 345,720, Feb. 24, 1982, abandoned, which is a continuation-in-part of Ser. No. 156,419, Apr. 20, 1982, Pat. No. 4,340,970. This application Mar. 19, 1984, Ser. No. 590,963

Int. Cl.[4] F03G *7/06*

U.S. Cl. 60—531 5 Claims



1. A heat engine comprising:

(a) a plurality of thermal actuators mounted radially about an output shaft;

(b) a gear means on said output shaft;

(c) each thermal actuator having an output element consisting of a pinion gear capable of rotation when the actuator is in an energized state;

(d) each pinion gear being selectively engageable with the gear means on said output shaft;

(e) each thermal actuator comprising,

(1) a heating element communicating with a pressure chamber,

(2) a vaporizable liquid in said pressure chamber,

(3) each output element extending into said pressure chamber and being actuated by vapor pressure within said pressure chamber,

(4) a cooling chamber,

(5) a valve member capable of establishing fluid communication between the cooling and pressure chambers in a first position, and closing communication between the chambers in a second position,

(6) a valve actuator communicating with said valve member and extending out of the thermal actuator in a radial direction opposite that of the output element,

(f) a circular cam means circumscribing the output shaft and the radially extending valve actuators,

(g) each valve actuator being in operative engagement with the cam means during at least part of the cycle of the engine,

whereby the operative engagement of the valve actuators with the cam means causes said valve members to alternately establish and disconnect the pressure chambers with the cooling chambers, such that alternating pressure pulses in said pressure chambers move said pinion gears on the output elements into operative engagement with the gear means on the output shaft while concurrently rotating said pinion gears to provide rotary motion to said gear means and the output shaft thereon.

4,577,465

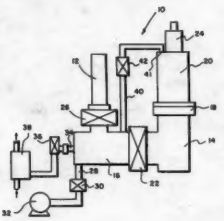
OIL FREE VACUUM SYSTEM

Donald A. Olsen, Millis, and Michael J. Eacobacci, Randolph, both of Mass., assignors to Helix Technology Corporation, Waltham, Mass.

Filed May 11, 1984, Ser. No. 609,481

Int. Cl.[4] B01D *8/00*

U.S. Cl. 62—55.5 22 Claims



1. A vacuum system comprising:

a. a work chamber;

b. a load lock for receiving material to be introduced into and removed from the work chamber;

c. a first cryopump for fluid communication with the work chamber;

d. a second cryopump for fluid communication with the load lock through a valve; and

e. a gas ejector for initial depressurization of said load lock to a cross-over pressure when the valve to the second cryopump is closed and materail is introduced to the load lock for transfer to the work chamber.

4,577,466

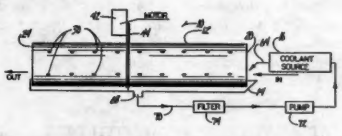
BY-PRODUCTS CHILLER AND METHOD FOR USING SAME

Larry L. Cunningham, P.O. Box 142, Murray, Nebr. 68409

Filed Jun. 26, 1985, Ser. No. 748,917

Int. Cl.[4] F25D *13/06*

U.S. Cl. 62—63 18 Claims



1. A by-product chiller comprising:

an elongated cylindrical tank having an inlet end for introducing fresh animal by-products into said tank and an outlet end for removing said by-products from said tank;

support means for rotatably supporting said tank;

means for introducing a liquid coolant from a coolant source into said tank;

an elongated rectangular trough, being larger in width and breadth than the longitudinal cross-section of said tank and centered therebelow, said tank having a plurality of rows of circumferentially spaced apertures therein, whereby said coolant will drain from said tank more or less evenly across its width and breadth into said trough;

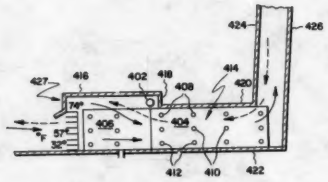
pump means operatively connected to said trough for recirculating said coolant to said coolant source for recooling thereby; and

means operatively connected to said tank for rotating said tank about its longitudinal axis such that said by-products are tumbled within said tank for exposure to said coolant and chilled thereby.

4,577,467
FROST DIFFUSION SYSTEM FOR REFRIGERATION APPARATUS

Fayez F. Ibrahim, and Edward E. Bowman, both of Niles, Mich., assignors to Tyler Refrigeration Corporation, Niles, Mich.

Filed Oct. 30, 1984, Ser. No. 666,327
Int. Cl.[4] A47F 3/04
U.S. Cl. 62—82 **34 Claims**



1. In a refrigerated container apparatus having a plurality of outer walls and a product storage compartment located therein, an air conduit adapted to conduct refrigerated air within said apparatus, and air moving means for propelling an air band within said air conduit in a first direction during a refrigeration cycle and in a second direction during a defrost cycle and an access opening for placing and withdrawing products into and from said storage compartment, the improvement comprising:

an evaporator unit having a cooling tube core and associated guide panels, said cooling tube core having a front air opening, at least one side air opening, and a back air opening positioned for permitting unimpeded flow through of said propelled air band;

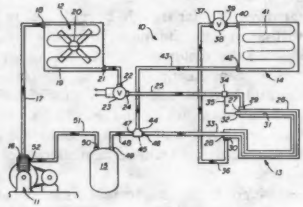
said evaporator unit adapted to permit simultaneous inflow of said air band from at least, two directions during the refrigeration cycle, one of which is into said front air opening and another of which is into said side air opening for contact with said cooling tube core to diffuse frost formation uniformly during the refrigeration cycle, and

said guide panels adapted to permit a part of said air band to bypass said front air opening of said cooling tube core and to flow adjacent to a substantial length of said side air opening prior to flow thereinto during the refrigeration cycle and to direct said air band flow out of said cooling tube core through said back air opening and said guide panels adapted to permit reverse air flow through said air openings during a defrost cycle.

4,577,468
REFRIGERATION SYSTEM WITH REFRIGERANT PRE-COOLER

John O. Nunn, Jr., P.O. Box 397, and John O. Nunn, Sr., 4414 Durant, No. 66, both of Deer Park, Tex. 77536

Filed Jan. 4, 1985, Ser. No. 688,727
Int. Cl.[4] F25B 41/00
U.S. Cl. 62—113 **20 Claims**



1. A refrigeration system comprising a compressor, a condenser, and an evaporator connected in series with the outlet of the compressor being connected to the inlet to the condenser to conduct compressed refrigerant gas thereto, the outlet of the condenser connected to the inlet of the evaporator to conduct liquid refrigerant thereto, and the outlet of the evaporator connected to the inlet to the compressor to conduct vaporized refrigerant thereto,

further including

heat exchange means positioned between the outlet from said condenser and the inlet to said evaporator to pre-cool the liquid refrigerant flowing therebetween by vaporization of part of the liquid refrigerant before said refrigerant reaches said evaporator,

said heat exchange means comprising a heat exchanger having two flow passages one inside the other, each having an inlet and an outlet, and in heat exchange relation one with the other,

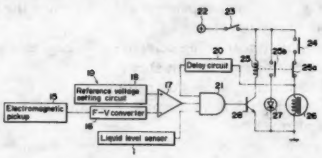
the outer one of said heat exchange flow passages being connected between said condenser and said evaporator in series therewith to conduct the main body of liquid refrigerant flowing therebetween surrounding said inner flow passage, and

the inner one of said heat exchange flow passages being connected to receive a small portion of said liquid refrigerant and permit the same to evaporate to cool the main body of liquid refrigerant flowing through said outer surrounding flow passage.

4,577,469
DEVICE FOR DETECTING OVERCHARGE OF REFRIGERANT IN AIR CONDITIONER FOR AUTOMOBILES

Eiji Okura, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Jun. 20, 1984, Ser. No. 623,766
Claims priority, application Japan, Jul. 2, 1983, 58-103246[U]
Int. Cl.[4] F25B 49/00
U.S. Cl. 62—126 **4 Claims**



1. A device for detecting overcharge of refrigerant in an air-conditioner for automobiles, comprising a speed detector means for detecting the rotational speed of the compressor drive system in a cooling cycle, a liquid level sensor for detecting the liquid refrigerant level in a receiver tank in said cooling cycle, a means for delaying the ON signal of said compressor for a predetermined period of time, and a control means which outputs an overcharge detection signal only when all of said speed detector means, liquid level sensor and delay means gave an output.

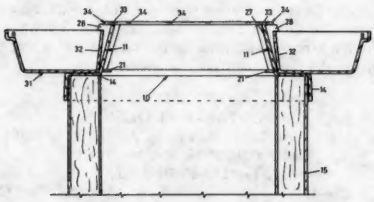
4,577,470
AIR COOLER ADAPTOR

Anthony D. Kearney, St. Marys, Australia, assignor to F. F. Seeley Nominees Pty Ltd, St. Marys, Australia

Filed Nov. 2, 1984, Ser. No. 667,650
Claims priority, application Australia, Nov. 4, 1983, PG2219
Int. Cl.[4] F25D 23/12
U.S. Cl. 62—259.4 **8 Claims**

1. An adaptor for supporting an air cooler, said air cooler being of the type having walls extending upwardly from a base and within the cooler perimeter for defining a cool air outlet, said adaptor comprising at least one pair of opposed, rela-

tively fixed panels, each of said pair of panels terminating along its lower edge in an L-shaped flange extending outwardly and downwardly in a direction away from the other of said pair of panels, and each of said pair of panels having outwardly projecting barbs,



the sizes and shapes of said L-shaped flanges and said barbs being such that, when the adaptor supports an air cooler from the upper end of ducting, said flanges overlie and surround said ducting upper end and said barbs engage the walls of said cool air outlet of said air cooler.

4,577,471

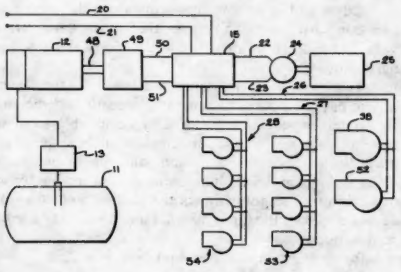
AIR CONDITIONING APPARATUS

Gershon Meckler, New York, N.Y., assignor to Camp Dresser & McKee, Inc., Boston, Mass.

Continuation of Ser. No. 87,391, Oct. 22, 1979, abandoned, which is a continuation of Ser. No. 886,389, Mar. 14, 1978, abandoned. This application Jun. 1, 1982, Ser. No. 383,450

Int. Cl.⁴ F25D *23/00*

U.S. Cl. 62—271 **22 Claims**



1. Apparatus for dehumidifying air, said apparatus comprising, in combination, a dehumidifier which employs a desiccant, a cooling coil, power means effective to convert a fuel into heat energy and electrical energy, means for transferring heat from said power means into regenerating relationship with the desiccant of said dehumidifier, means including a sensor-controller operable to control said power means to maintain the temperature at which heat is transferred therefrom into regenerating relationship with the desiccant of said dehumidifier within limits, means including at least one blower for circulating air in dehumidifying relationship with said dehumidifier and for circulating air in heat transfer relationship with said cooling coil, refrigeration apparatus including a heat collecting section, a heat rejection section and an energy input section, means for transferring heat from said cooling coil to the heat collecting section of said refrigeration apparatus, and means operatively connected to receive electrical energy from said power means, and effective to supply such energy to power at least some of the pumps, blowers and the like of the dehumidifying apparatus.

4,577,472

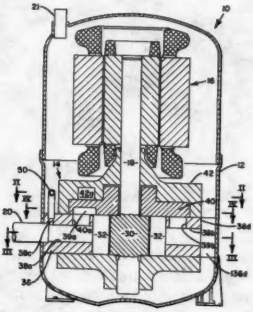
REVERSIBLE ROTATING VANE ROTARY COMPRESSOR HAVING A MOVABLE SUPPLEMENTAL SUCTION PORT

Prakash N. Pandeya, Clay, and Tsuwei Chu, Liverpool, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Feb. 25, 1985, Ser. No. 705,294

Int. Cl.⁴ F25B *13/00*; F01C *21/12*; F04B *35/04*

U.S. Cl. 62—324.6 **5 Claims**



1. A reversible hermetic compressor unit comprising:

shell means having first and second lines connected thereto;

rotary compressor means within said shell means;

motor means within said shell means for selectively driving said rotary compressor means in a clockwise or a counterclockwise direction;

said rotary compressor means including:

a compressor chamber with a rotating vane rotor therein;

a first fluid passage means fluidly connected to said first line and said compressor chamber;

a second first passage means fluidly connected to said second fluid line and said compressor chamber;

a third fluid passage means fluidly connected to said first fluid passage means;

a fourth fluid passage means fluidly connected to said second fluid passage means; and

means movable in response to the pressure differential between said first and second lines to position a supplemental suction port in communication with either said first fluid passage means via said third fluid passage means or said second fluid passage means via said fourth fluid passage means and said chamber according to which of said first and second fluid passage means is the suction line as determined by the direction in which said motor means drives said rotary compressor means.

4,577,473

ICE PRODUCT MAKING MACHINE

Fumio Ishiguro, Toyohashi, Japan, assignor to Hoshizaki Electric Co., Ltd., Toyoake, Japan

Filed Oct. 16, 1984, Ser. No. 661,327

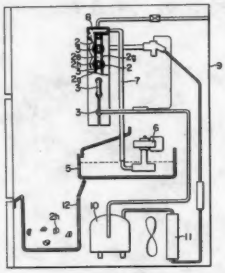
Claims priority, application Japan, Oct. 17, 1983, 58-159379[U]

Int. Cl.⁴ F25C *1/12*

U.S. Cl. 62—347 **1 Claim**

1. A freezing unit for an ice product making machine which comprises one or more substantially upright freezing plates having a plurality of vertically extending and transversely spaced apart rib-like projections, and a meandering cooling coil in direct mechanical contact with the reverse side or sides of said freezing plate or plates, said cooling coil being composed of a plurality of straight sections connected together by bends, wherein the straight sections are flattened on lateral side portions, the terminal portions of said bends contiguous to said straight sections are flattened on lateral side portions to a

thickness approximately equal to the thickness of the flattened lateral side portions of the straight sections, the central portions of said bends being of a lesser thickness than the thickness of said flattened lateral side portions of said straight sections and wherein the flattened lateral side portions of the said



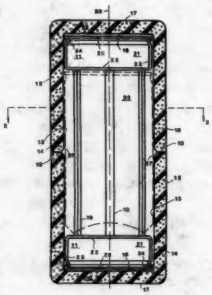
straight sections and the terminal portion of said bends contiguous to said straight sections are in direct mechanical contact with the back side or sides of said freezing plate or plates and said central portions of said bends are substantially out of contact with said freezing plate or plates.

4,577,474

THERMALLY INSULATED HOLDER FOR A SINGLE BEVERAGE CAN

Walter E. Peterson, Box 696, Diablo, Calif. 94528

Filed Feb. 23, 1985, Ser. No. 706,939
Int. Cl.[4] F25D *3/08*
U.S. Cl. 62—457 **4 Claims**



1. A thermally insulated holder for a single beverage-containing can comprising:

(a) two identical holding jackets, each being an integral monolithic structure fabricated of closed cell foam of a resilient polymeric material and having a cylindrical sidewall, a substantially flat bottom closure wall, an open upper extremity defined by a flat circular end face disposed in a plane perpendicular to the axis of said sidewall, and a series of equally spaced grooves within the interior surface of said sidewall in parallel disposition to said axis and terminating in said open upper extremity, and

(b) two identical refrigerant containers, each comprised of a thin-walled can having a flat bottom, a cylindrical sidewall adapted to fit snugly within the sidewall of said jacket, and a flat closure lid, the height of the refrigerant container, measured along the axis of its sidewall being between about 30% and 40% of the interior height of the jacket, measured along the axis of the sidewall of the jacket, the ratio of height/diameter of said can being in the range of about 0.5 and 0.8,

(c) each refrigerant container residing in abutment with the bottom closure of each jacket, whereby

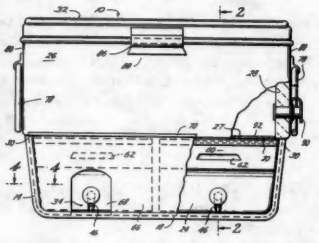
(d) when the two jackets are brought together about a beverage can, the can makes close-fitting contact with the interior surfaces of the sidewalls of the jacket, the top and bottom of the can contact the refrigerant containers, and the flat circular end faces of the jackets are in abutment.

4,577,475

PORTABLE COOLER

Samuel R. Herrera, 2303 Santa Rosa, Austin, Tex. 78702

Filed Apr. 9, 1985, Ser. No. 721,199
Int. Cl.[4] F25D *3/08*
U.S. Cl. 62—457 **6 Claims**



1. A portable cooler comprising:

a base compartment having insulated walls, an insulated bottom, at least one accessible recess and a top;

a generally rectangular container having insulated walls secured to and extending upwardly from the top of said base compartment and a bottom, the bottom being a transverse partition also indentified as the top of the base compartment;

at least two closable bins slidably insertable into the recesses of said base in a position generally beneath said rectangular container, said bins being fully removable from said recesses, having upward openings with lids slidably or hingedly attached thereto, each said bin further having walls and means for draining liquids from the bin by way of a drip-proof spigot in one of the walls in a position to be accessible when the bin is inserted into a recess to the base compartment;

means for draining liquid from said container; and

means for covering said container.

4,577,476

LOW WET PICKUP FABRIC FINISHING APPARATUS

Allan H. Lambert, Metairie; Esmond J. Keating, New Orleans, and Gerald B. Verburg, Metairie, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jul. 31, 1984, Ser. No. 636,451
Int. Cl.[4] D06B *5/08*
U.S. Cl. 68—5 D **10 Claims**

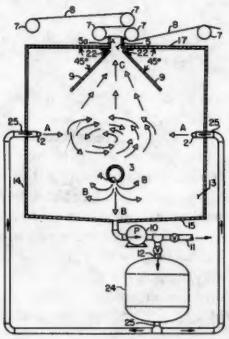
1. An apparatus for applying atomized spray solutions to fabric to produce low wet pickup, uniformly finished fabrics comprising:

(a) a chamber;

(b) means for spraying solution mixed with air into said chamber to form a cloud of atomized solution spray particles;

(c) a manifold with open ends mounted to and through opposing chamber sides so that air can be externally fed through the open ends thereof and out of a plurality of exit air holes which are located laterally along the side of the manifold facing the bottom side of the chamber so that air

exiting the holes strikes the bottom side of the chamber and returns to mix the atomized spray solution in the center of the chamber as well as incresae the internal air pressure; and,



(d) an opening in said chamber through which said cloud, moved by internal air pressure, exits and contacts fabric juxtaposed across the external periphery of said opening, said fabric adsorbing the solution particles on contact and allowing air to pass through, thereby producing a low wet pickup, uniformly finished fabric.

4,577,477

ACCESSORY LOCK AND ARTICLE STORAGE DEVICE FOR BICYCLES AND THE LIKE

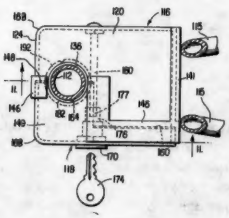
Michael C. Olshausen, 1816 Kalorama Rd., NW., Apt. 105, Washington, D.C. 20009

Continuation-in-part of Ser. No. 457,459, Jan. 12, 1983, Pat. No. 4,468,939. This application Nov. 7, 1983, Ser. No. 549,415

The portion of the term of this patent subsequent to Sep. 4, 2001, has been disclaimed.

Int. Cl.[4] E05B *73/00*

U.S. Cl. 70—58 **5 Claims**



1. An article storage device adapted to be attached to a frame of a bicycle or the like comprising:

(a) first and second members adapted to frictionally engage said frame member, said first and second members each having a side wall connected to spaced-apart top and bottom walls and together forming an enclosed storage space when brought into engagement with said frame member, said top and bottom walls each have an indented portion shaped to surround a portion of said frame, said shape of said indented portion of at least one of said members being less than a full semi-circle to enable said frictional engagement with said frame member to be varied when said first and second members are drawn together into contact with said frame member,

(b) support means adapted to be positioned on said frame to prevent said first member individually or said first and second members when in engagement with each other from sliding on said frame, said support means having a cylindrical-shaped body portion with a radially extending flange adapted to engage and support said top wall of said first member, and

(c) means for locking said first and second members together to effect securement of said device to said frame member.

4,577,478

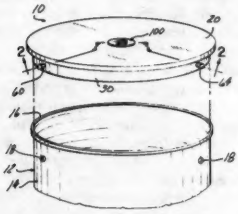
LOCKING FILLER TUBE COVER APPARATUS FOR UNDERGROUND FUEL TANKS

Dennis O. Economopoulos, and Othon Economopoulos, both of 3589 Beaconsfield, Detroit, Mich. 48224

Filed Aug. 26, 1983, Ser. No. 526,709

Int. Cl.[4] B65D *55/14*

U.S. Cl. 70—168 **8 Claims**



1. A locking apparatus for underground fuel tanks having a vertically extending filler tube with a plurality of apertures in the side walls thereof, the locking apparatus comprising:

a cover having top and bottom surfaces and a centrally located aperture;

an annular flange depending from the bottom surface of the cover, having a plurality of apertures formed in the flange and alignable with the apertures in the fuel tank filler tube;

lock means mounted on the cover and selectively movable between a first locked position and a second unlocked position;

a plate mounted on and rotated by the lock means between the first and second positions;

a plurality of lock bars, each slidingly received in one aperture on the flange of the cover, the lock bars having first and second ends, with the first end being pivotally mounted on the plate, and the second end being slidingly engagable with an aperture in the filler tube when the lock means and plate are rotated to the first locked position to lock the cover on the filler tube when the lock means and plate are rotated to the second unlocked position to unlock the cover from the filler tube; and

first means for removably covering the lock means to prevent access to the lock means, comprising:

a first boss mounted on the bottom surface of the cover, the first boss having a bore co-axially aligned with the aperture in the cover and including internal threads extending from an upper end thereof;

a disc having external threads on the first boss; engagable with the internal threads on the first boss;

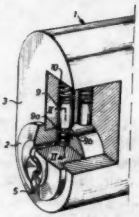
a cavity formed in the disc; and

a first key means having an outwardly extending projection complementary to the cavity in the disc and insertable into the cavity to permit removal of the disc from the first boss.

4,577,479
CYLINDER LOCK ARRANGEMENT FOR PREVENTING PICKING

Bo Widén, Torshälla, Sweden, assignor to GKN-Stenman AB, Eskilstuna, Sweden

Continuation of Ser. No. 435,202, Oct. 19, 1982, abandoned. This application Apr. 30, 1985, Ser. No. 727,626
Claims priority, application Sweden, Nov. 2, 1981, 8106467
Int. Cl.[4] E05B *15/14, 35/10, 27/04*
U.S. Cl. 70—364 A 3 Claims



1. A master set type of cylinder lock, comprising: a cylindrical plug (2) rotatably mounted in a plug housing (3), said plug being rotatable in said housing when a correct key is inserted in said plug, and said housing closely surrounding said plug without any significant gaps therebetween, a plurality of transverse pin passages (6, 8) respectively defined in said plug and housing, said passages being axially aligned during key insertion, a plurality of transversely slidable, rotatable pin pairs (7, 9) disposed in said passages, one pin in each pair being spring biased (10) in a direction towards the other pin, and abutment surfaces of said pin pairs, when the correct key is inserted, being located in a dividing plane between the plug and the housing, at least one pin (9), at an end thereof facing an opposite, co-acting pin, having a portion of smaller diameter than the remainder thereof, said portion forming a necked region (9*a*) between a main part of said at least one pin and a generally cylindrical head (9*b*) on the end of said at least one pin, a passage for said at least one pin defining a pair of diametrically opposed, laterally extending recesses (6*a*) in line with said at least one pin at a distance from a mouth of the passage shorter than the axial length of the necked region of said at least one pin and having widened portions defined on one side by an edge (2*a*) of the mouth of the passage, said edge, upon the rotation of the plug through a small angle, being able to overlap the head of said at least one pin and hook-latch said at least one pin in a locked position, said widened portions having an eccentric shape with a largest dimension transverse to a longitudinal axis of the plug, at least one disc-like pin member (11) of the same diameter as said pin pairs disposed between said at least one pin and its coacting pin, the head of said at least one pin having a smaller diameter than the main part thereof; and the radii of the widened portions of the recesses transverse to the plug axis being less than half the diameter of said at least one pin, whereby the smaller diameter pin head may enter the recesses but the disc-like pin member may not.

4,577,480
METHOD AND APPARATUS FOR CONTROLLING ROLLING CORRECTION IN ROLLING MILL

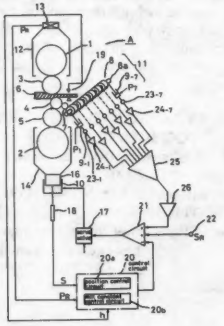
Kanji Kizaki, Ebina; Hajime Ishii, Tokyo; Noboru Taguchi, and Hiroshi Kuwamoto, both of Fukuyama, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha and Nippon Kokan Kabushiki Kaisha, both of Tokyo, Japan

Filed Jun. 7, 1984, Ser. No. 618,132
Claims priority, application Japan, Jun. 22, 1983, 58-112099; Jun. 22, 1983, 58-112100
Int. Cl.[4] B21B *37/12, 29/00*
U.S. Cl. 72—8 3 Claims

1. In a rolling mill of the type having a rolling device responsive to displacement of a rolling drive body for producing a vertical rolling force between a pair of work rolls, a horizontal bending device for exerting pushing forces to at least one of said pair of work rolls in a direction substantially in parallel with passage of a strip being rolled, thereby bending the work roll, and a rolling control device for receiving a rolling position setting signal so as to set a position of said rolling drive body and for controlling said rolling device such that a thickness of the strip leaving said pair of work rolls can be maintained constant,

a method for controlling correction in the rolling mill which comprises detecting the forces exerted by said horizontal bending device to the corresponding work roll or detecting a position of said rolling drive body in a direction of said pushing forces and applying a thus detected signal to an input point of said rolling position setting signal in said rolling control device, whereby variations in rolling load due to the pushing forces can be eliminated or cancelled.

2. A rolling mill comprising: a pair of work rolls, and a rolling drive body connected to said rolls, a rolling device responsive to displacement of said rolling drive body for producing a vertical rolling force between said pair of work rolls,



a horizontal bending device operatively connected to at least one of said work rolls and including a plurality of pushing means for individually exerting pushing forces to at least one roll of said pair of work rolls in a direction substantially in parallel with passage of a strip being rolled between said work rolls, and a rolling control device operatively connected to said rolling drive body and said bending device, for receiving a rolling position setting signal therefrom for setting a position of said rolling drive body and for controlling said rolling device such that a thickness of the strip leaving the pair of work rolls may be maintained constant, said control device comprising sensors connected to said plurality of pushing means for detecting the pushing forces produced by said plurality of pushing means or for detecting positions, in a direction of said pushing forces, of individual pushing drive bodies in said pushing means, and an operational means operatively connected to said sensors for obtaining a sum of output signals from said sensors and for applying an output signal derived from said sum to an input point of said rolling position setting signal in said rolling control device with such a polarity that variations in rolling load due to the pushing forces produced by said plurality of pushing means can be eliminated or cancelled.

4,577,481

PROCESS FOR PRODUCTION OF SEAMLESS TUBE AND APPARATUS FOR PROCESSING SEAMLESS TUBE

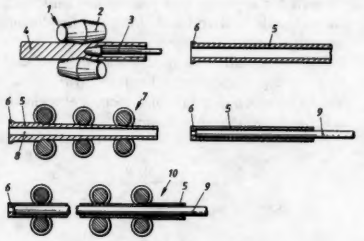
Karlhans Staat, Homberg, Fed. Rep. of Germany, assignor to Kocks Technik GmbH & Co., Hilden, Fed. Rep. of Germany

Filed Mar. 12, 1984, Ser. No. 588,244

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1983, 3309797

Int. Cl.[4] B21B *19/04*

U.S. Cl. 72—68 7 Claims



1. A process for the production of seamless tube comprising the steps of

(a) centrally piercing an ingot to form a generally axial hole through its entire length by diagonally rolling said ingot over a piercing mandrel on the end of a mandrel rod;

(b) forming a short wall thickening at one end of said ingot extending one of radially outwardly, radially inwardly and both radially outwardly and inwardly around said axial hole at the end of the piercing operation.

(c) Rolling said short wall thickening at said one end of said ingot without internal support to reduce the diameter of the axial hole at said one end to form a thickened support member of generally uniform thickness for the end face of a mandrel;

(d) inserting a push bench mandrel into said axial hole to abut the previously formed support member;

(e) rolling said ingot in a push bench to form a seamless tube having a thickened support member at one end; and

(f) removing said support member to form a completed seamless tube.

4,577,482

METHOD AND APPARATUS FOR TREATING WORK ROLLS IN A ROLLING MILL

Joseph I. Greenberger, Pittsburgh, Pa., assignor to Wean United, Inc., Pittsburgh, Pa.

Filed Jun. 18, 1984, Ser. No. 621,754

Int. Cl.[4] B21B *27/10*

U.S. Cl. 72—201 11 Claims

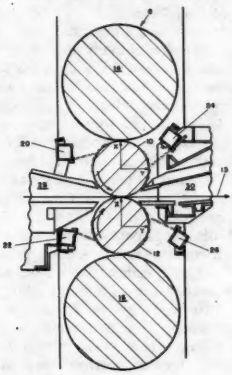
1. A method for the treatment of a rotating work roll of a rolling mill or the like for working a workpiece wherein the roll absorbs heat during the rolling process due to its contact with an external element, such as said workpiece, the steps comprising:

creating at least one wall of treatment medium by a medium discharge header means, said wall being in the form of a non-turbulent low pressure coherent curtain wall applied continuously across at least a selected axial portion of the face of said roll,

controlling the placement of said at least one coherent curtain wall so that said medium is caused to be uniformly delivered to said roll substantially coextensive with said selected portion,

causing said wall to be directed against said portion from a position where the header means is spaced from said portion and is located at a point remote from where said external element leaves contact with said roll, and wherein because of the inherent nature of the wall it maintains its wall-like form from the time it leaves the header means until it first contacts the roll at said portion without any assistance from any physical medium directing means, and

causing said coherent curtain upon impingement to separate into two opposed film-like fields around and on said face of said roll, which said fields freely adhere to said face for a certain length of time without assistance from any physical film-forming and retaining means,



said one film-like field travelling in a direction opposite to that of said rotation of said work roll toward the general region where said external element leaves contact with said roll to thereby uniformly treat the peripheral surface of said roll between said initial point of application of said medium and said contact area of said external element.

4,577,483

SYSTEM FOR THE CONTINUOUS OPERATION OF A COLD PILGER ROLLING MILL

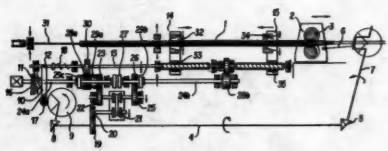
Klaus Rehag, Monchen-Gladbach, and Josef Gerretz, Viersen, both of Fed. Rep. of Germany, assignors to Mannesmann Demag Wean, Pittsburgh, Pa.

Filed Jan. 31, 1984, Ser. No. 575,607

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1983, 3304002

Int. Cl.[4] B21B *21/04*

U.S. Cl. 72—214 10 Claims



1. In a cold pilger rolling mill having a reciprocating roll stand with repetitive cyclic periods of operation, an improved feed system arranged on the entry side of said mill for continuously feeding a shell along a passline of said mill between rolls in said roll stand to be reduced therebetween, comprising:

feed carriage means positioned along said passline for displacement towards and away from said stand respectively corresponding to a shell feed starting position and a shell feed finishing position, said feed carriage means including first and second tandemly arranged feed carriages having chucks engageable with said shell for said advancement of

said shell through said mill in said sh :ll feed starting position of each carriage,

feed screw means mounted in each of said feed carriages for effecting said displacement of said feed carriages relative to said stand and each said feed screw means having an adjacent end arranged in coaxial alignment relative to each other,

first drive means driven in a timed relationship to said mill reciprocation and connected to said each feed screw means to impart a translational movement thereto to reciprocate said feed carriages together as a unit with said reciprocation of said rolling stand, and

second drive means selectively driven by said first drive means including a gear unit connected to each said feed screw means of said first and second carriages and shaft clutch assembly means selectively engaging and disengaging said each gear unit so that upon said engagement superimposed on said reciprocation of said each feed carriage rotation is imparted to said feed screw means to move said first and second feed carriages separately and independently in unison in the same direction or in opposite directions relative to each other and said stand, and upon said disengagement rotation of said feed screw means is discontinued to maintain said feed carriages separately and independently in a fixed position,

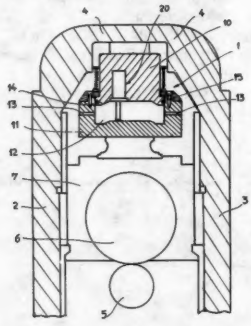
said gear unit for said second carriage which is closer to said roll stand than said first feed carriage includes thrust bearing means supporting and mounting said adjacent end of both said feed screw means in said coaxial alignment and effectively located between said two gear units in close proximity to said carriages to offset thrust loads on both said feed screw means and their said respective gear unit caused by said operation of said first and second carriages and said roll stand.

4,577,484

HYDRAULIC SAFETY DEVICE FOR A MECHANISM FOR CLOSING UP THE ROLLS OF A ROLLING MILL

Michel Morel, Chelles, and Bernard Pillac, Montrouge, both of France, assignors to CLECIM, Courbevoier, France

Filed Jul. 12, 1984, Ser. No. 630,170
Claims priority, application France, Jul. 22, 1983, 83 12148
Int. Cl.[4] B21B *31/32*
U.S. Cl. 72—245 **5 Claims**



1. An hydraulic safety device for a mechanism for closing up the rolls of a rolling mill comprising working rolls between which a product to be rolled is passed, and an hydraulic jack for controlling the pressure for closing up said rolls, said hydraulic jack consisting of first and second elements comprising a fixed element and a movable element, one of said elements comprising a piston and the other element a casing surrounding said piston, said two elements being slidably axially movable with respect to one another and delimiting a control chamber connected with a system for supplying pressurized hydraulic fluid comprising a supply duct and a return duct, said safety device comprising

(a) a discharge flap slidably mounted for closing at least one outlet orifice at said control chamber, said outlet orifice being connected with said return duct for reducing the pressure in said control chamber by passage of hydraulic fluid when said discharge flap is opened;

(b) a rod slidably mounted parallel to said axis on said first element of said jack and extending within said control chamber; and

(c) means for applying said rod against said second element of said jack, said rod following the displacement of said second element;

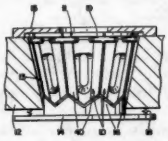
(d) said rod comprising means for opening said discharge flap for a predetermined limiting position as soon as the stroke between said first and second elements of said jack reaches a predetermined limit.

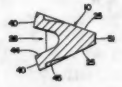
4,577,485

SPLIT BACK DIE SEGMENT

Luis Moreiras, Mentor, Ohio, assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Dec. 23, 1983, Ser. No. 564,875
Int. Cl.[4] B21D *41/04, 19/10*
U.S. Cl. 72—402 **10 Claims**





5. An array of die segments arranged in a circle in a tapered bowl of a crimping machine said tapered bowl being defined by a bowl surface having a narrower end relative to an opposite end with the ends being located along an axis, said die segments arranged in said bowl for axial movement toward the narrow end of the bowl and radial contracting movement directly toward the center of the bowl without angular shifting of adjacent die segments, each die segment comprising a pair of conical, outer spaced surfaces contracting said bowl surface, and a central surface intermediate and radially recessed from said outer surfaces, said central surface being free from contact with said bowl and structure external of said surfaces of said die segment, such that said die segment is unguided by means other than said bowl at said outer surfaces, during movement relative to said bowl, and means for moving said array of die segments simultaneously toward the narrow end of said bowl with all of said spaced outer surfaces in continuous contact with said bowl surface.

4,577,486

RETRACTING MECHANISM AND JAW ASSEMBLY FOR A POWER PRESS

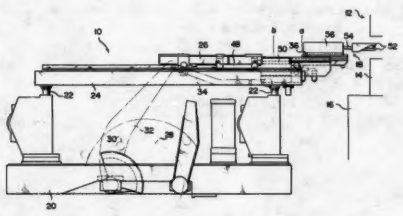
Kiyokazu Baba, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed May 13, 1983, Ser. No. 494,397

Claims priority, application Japan, May 17, 1982, 57-70552[U]

Int. Cl.⁴ B21D *43/02, 43/10, 43/13*

U.S. Cl. 72—421 **1 Claim**



1. A retracting mechanism for a power press including a die assembly and bolster comprising:

(a) guide means;

(b) a plurality of columns for supporting thereon said guide means;

(c) a main carriage movable along said guide means toward and away from the press;

(d) means for reciprocating the main carriage along said guide means in synchronization with the operation of the press;

(e) a subcarriage mounted on said main carriage for movement relative to same toward and away from the press;

(f) means for moving said subcarriage between a forward working position and a retracted position relative to said main carriage;

(g) a jaw assembly mounted on said subcarriage, said jaw assembly having a pair of gripping jaws and a fluid actuated cylinder fixedly mounted on said subcarriage for operating said gripping jaws; and

(h) means for retracting said subcarriage independently of said means for reciprocating the main carriage, whereby said subcarriage may be retracted for purpose of changing said die assembly and bolster.

4,577,487

PRESSURE VESSEL TESTING

John G. Dooley, 5282 Pastatiemop Dr., Yorba Linda, Calif. 92686

Filed Dec. 14, 1984, Ser. No. 681,605

Int. Cl.⁴ G01N *29/04;* G01M *3/24*

U.S. Cl. 73—37 **19 Claims**

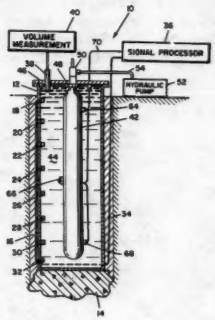
1. In combination:

(a) a container for water;

(b) means for immersing a pressure vessel in water in said container;

(c) pressurization means for altering pressure in the vessel and maintaining the pressure at selected pressures;

(d) sensor means in the form of at least one acoustic event sensor for sensing acoustic events emanating from flaws which do not extend through the wall of the pressure vessel at predetermined positions relative to the surfaces of said vessel; and



(e) recording means for recording the characteristics of acoustic events sensed by said sensors.

4,577,488

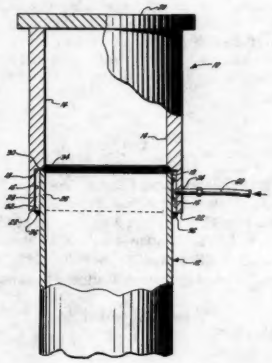
APPARATUS AND METHOD FOR INSPECTING WELDS

Ronnie J. Broadus, and Randall Slade, both of P.O. Box 418, Belle Chasse, La. 70037

Filed Oct. 22, 1984, Ser. No. 663,563

Int. Cl.⁴ G01M *3/04*

U.S. Cl. 73—40 **20 Claims**



1. A method of testing for leaks in the welds securing a first annular conduit to a second annular conduit, comprising the steps of:

providing first and second adjacent, coaxially aligned conduits, an open end of the first conduit receiving therein an open end of the second conduit in overlapping, co-axially aligned relationship, the areas of overlap of the two conduits forming an annular chamber between the overlapping conduits, the chamber having an open upper juncture and an open lower juncture;

placing a continuous weld along the upper juncture and a continuous weld along the lower juncture to secure the first conduit to the second conduit;

heating a fluid to a temperature similar to the temperature of the conduit and welds after welding;

introducing the heated fluid into the chamber before the welds have cooled to test for leaks.

4,577,489

DETECTING LEAKS

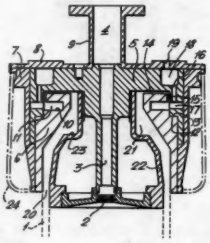
Peter E. G. Marshall, Stratford-Upon-Avon; Francis R. Piper, Evesham, and John F. Wilson, Thornbury, all of United Kingdom, assignors to BL Technology Limited, Great Britain

Filed Jan. 17, 1984, Ser. No. 571,665

Claims priority, application United Kingdom, Jan. 19, 1983, 8301407

Int. Cl.[4] G01M 3/04

U.S. Cl. 73—40.7 12 Claims



1. A leak detector having a probe and a circular opening surrounding the probe through which circular opening a barrier gas can be fed, wherein there is provided: a relatively wide annular chamber having a plurality of inlet channels for entry of barrier gas spaced around its circumference or a continuous inlet channel around its circumference and having a plurality of outlet channels spaced around its circumference or a continuous outlet channels around its circumference, the inlet and outlet channel(s) being inclined to each other so no straight path exists through the inlet and outlet channel(s); a relatively narrow circumferential orifice which is coaxial with the annular chamber and communicates with the outlet channel(s); and an annular duct defined by inner and outer walls which is coaxial and in communication with the circumferential orifice, is symmetrical about the axis of the duct, and defines the circular opening.

4,577,490

DETECTING LEAKS

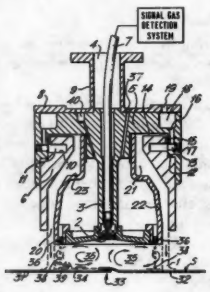
David J. Bray, Bromsgrove; Peter E. Johnson, Redditch; Peter E. G. Marshall, Stratford on Avon; Francis R. Piper, Evesham, and Iain H. Murdoch, Meriden, all of United Kingdom, assignors to BL Technology Limited, England

Filed Sep. 6, 1984, Ser. No. 647,547

Claims priority, application United Kingdom, Sep. 7, 1983, 8323997

Int. Cl.[4] G01M 3/20

U.S. Cl. 73—40.7 10 Claims



1. A leak detector comprising a detector head for scanning a surface for detection of escape of signal gas through the surface, the head comprising a sample inlet, an annular opening surrounding the inlet, means for directing a barrier gas through the annular opening to provide a gas curtain around the inlet and a plurality of orifices within the area enclosed by the curtain for providing gas jets to impinge on the surface.

4,577,491

METHOD FOR DETERMINING THE STABILITY OF FOAM

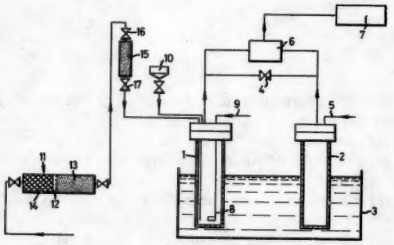
Ian C. Callaghan, Wokingham, and Clive M. Gould, Staines, both of England, assignors to The British Petroleum Company, p.l.c., London, England

Filed Oct. 31, 1984, Ser. No. 666,651

Claims priority, application United Kingdom, Nov. 5, 1983, 8329624

Int. Cl.[4] G01N 33/22

U.S. Cl. 73—60.1 1 Claim



1. A method for determining the stability of a live crude oil/gas foam which method comprises the steps of

(a) pressurising a sample of crude oil containing gas,

(b) introducing the sample into a sample cell connected to a reference cell initially at the same pressure,

(c) reducing the pressure on the sample whereby a foam is generated,

(d) isolating the sample cell and the reference cell when the foam has developed and

(e) determining the subsequent change in pressure of the sample cell with reference to the reference cell.

4,577,492

ANALYTICAL METHOD AND APPARATUS

Albert G. Holba; Susanne B. Doe, both of Bartlesville, and William B. Hughes, Osage County, all of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 493,842, May 12, 1983, abandoned. This application Sep. 18, 1984, Ser. No. 652,155

Int. Cl.[4] G01N 31/08

U.S. Cl. 73—61.1 C 20 Claims

1. A method for analysis of a liquid sample of matter comprising a first organic constituent, a second organic constituent and an elemental sulfur constituent, the method comprising:

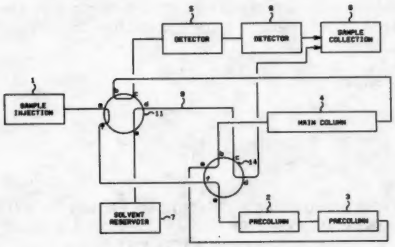
passing the sample of matter in a mobile phase through a first separations zone comprising a stationary phase under conditions effective for the retention of essentially all of the first organic constituent in the first separations zone;

passing an effluent comprising the second organic constituent and the elemental sulfur through a second separations zone under conditions effective for the separation of the second organic constituent from the elemental sulfur constituent;

removing the second organic constituent from the second separations zone and detecting a property of the second organic constituent;

removing the elemental sulfur constituent from the second

separations zone and determining a property of the elemental sulfur constituent; and



removing the first organic constituent from the first separations zone and determining a property of the first organic constituent.

4,577,493

DEVICE FOR PERFORMING MICROMECHANICAL MEASUREMENTS OF THE SURFACE OF TEST OBJECTS

Kurt M. Oesterle, Goldbacherstrasse 88, CH-8700 Küsnacht, Switzerland

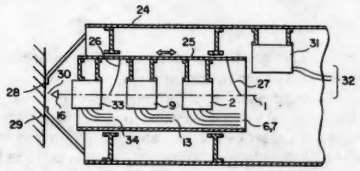
PCT No. PCT/CH83/00001, § 371 Date Sep. 23, 1983, § 102(e) Date Sep. 23, 1983, PCT Pub. No. WO83/02666, PCT Pub. Date Aug. 4, 1983

PCT Filed Jan. 6, 1983, Ser. No. 548,885

Claims priority, application Switzerland, Jan. 25, 1982, 440/82

Int. Cl.⁴ G01N *3/42*

U.S. Cl. 73—81 **18 Claims**



3. A measuring head for use in a micromechanical materials measurement system, comprising; a housing having a longitudinal axis, a contact surface at one end of said housing for positioning said housing on a surface layer of a test object, said contact surface being substantially perpendicular to said axis and having an opening therein about said axis, a measuring shaft disposed within said housing for displacement along said axis, said shaft being provided with an indentor at its end adjacent to said contact surface of said housing, said opening in said contact surface permitting the passage of said indentor beyond said contact surface, an electrically controllable displacement actuation device disposed within said housing and associated with said measuring shaft for displacing said measuring shaft along said axis towards said contact surface of said housing, and an electrical load sensor disposed within said housing and associated with said measuring shaft for continually measuring the load on said measuring shaft, said displacement actuation device and said load sensor being provided with electrical cable means for remote connection to an electronic control and processing device.

4,577,494

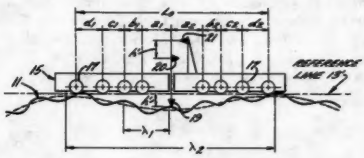
APPARATUS AND METHOD FOR MEASURING THE WEAR OF RAILROAD RAIL

Hans P. Jaeggi, Lugano, Switzerland, assignor to Jackson Jordan, Inc., Ludington, Mich.

Filed Aug. 19, 1983, Ser. No. 524,724

Int. Cl.⁴ G01B *5/28*

U.S. Cl. 73—105 **20 Claims**



1. Apparatus for measuring corrugations and undulations along the running surface of railroad rail comprising:

a chassis adapted for travel along said railroad rail;

at least four bearing points positioned between said chassis and said railroad rail for supporting said chassis on said rail and for allowing movement of said chassis over said rail, said bearing points being aligned so as to collectively define a reference line with any space between said bearing points being in an asymmetrical pattern to establish the reference line substantially between the highest points encountered by the bearing points by, whereby the distance between a sensing point on the reference line and said running surface represents substantially the actual wear of the running surface;

sensing means at the sensing point for continuously sensing the vertical distance between the reference line defined by the bearing points and the surface of the rail as the chassis travels along the rail, the sensing means having an output wheich is a function of the sensed distance between the reference line and the rail surface; and

means responsive to the output of said sensing means to indicate the corrugation and undulation in the rall surface.

4,577,495

APPARATUS FOR SHIELDING AND PROTECTING AN AIR FLOW RATE METER DISPOSED IN THE INTAKE TUBE OF AN INTERNAL COMBUSTION ENGINE FROM AIR COLUMN FLUCTUATIONS

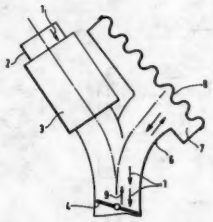
Franz Bamer, Vienna, Austria, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 12, 1985, Ser. No. 710,786

Claims priority, application Fed. Rep. of Germany, May 9, 1984, 3417050

Int. Cl.⁴ G01M *15/00*

U.S. Cl. 73—118 **5 Claims**



1. An apparatus for shielding and protecting an air flow rate meter, comprising a temperature-dependent resistor, which measures the mass the air aspirated by an internal combustion engine having an intake tube, an elastic diaphragm disposed on said intake tube downstream of said flow rate meter, said elas-

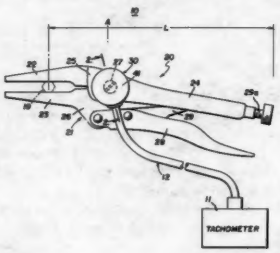
tic diaphragm adapted to divide a damping chamber which communicates with said intake tube from the atmosphere and said elastic diaphragm further arranged to maintain a virtually constant pressure in said damping chamber.

4,577,496

TRANSDUCER AND HOLDER THEREFOR FOR ULTRASONIC ACOUSTIC TACHOMETER

Donald D. Grover, and Glenn A. Kaufman, both of Kenosha, Wis., assignors to Snap-on Tools Corporation, Kenosha, Wis.

Filed Jan. 31, 1985, Ser. No. 696,930
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—119 A **20 Claims**



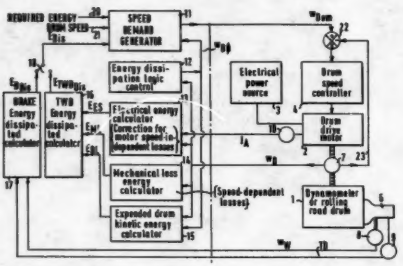
1. Apparatus for holding a transducer to sense ultrasonic acoustic emissions of a predetermined frequency caused by fluid flow through an orifice in a fuel injector body, said apparatus comprising: manually operable clamp means adapted to be clamped to the injector body so that the ultrasonic acoustic emissions thereof are transmitted to said clamp means, said clamp means having a length such that the ultrasonic acoustic emissions transmitted thereto establish therein standing waves substantially at the predetermined frequency or a harmonic thereof, and means mounting the transducer on said clamp means substantially at a region of maximum displacement in said standing wave for generating electrical signals in response thereto.

4,577,497

DYNAMOMETERS

Colin J. Ray, Chandler's Ford, and Geoffrey Smith, Eastleigh, both of England, assignors to Vickers Public Limited Company, London, England

Filed Nov. 1, 1984, Ser. No. 667,028
Claims priority, application United Kingdom, Nov. 11, 1983, 8330217; Aug. 15, 1984, 8420741
Int. Cl.[4] G01L *5/28*
U.S. Cl. 73—126 **13 Claims**



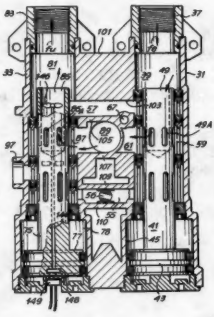
13. A dynamometer comprising a drum mounted for rotation and driven by drive means, a test body coupled to the drum for rotation therewith in a fixed velocity relationship, means for deriving the energy absorbed or dissipated by the test body, means for determining the rotational velocity of the drum or body, and control means responsive to the energy absorbed or dissipated and to the rotational velocity and operative to supply a control signal to the drive means to maintain the energy absorbed or dissipated as a predetermined function of the drum speed.

4,577,498

DOUBLE MULTIPLE CHANGE-OVER VALVE, FOR CONTROLLING THE OPERATION OF A WATER TREATMENT PLANT

Luigi Ferrali, Florence, Italy, assignor to S.I.A.T.A. Società Italiana Apparecchiature Trattamento Acqua S.p.A., Florence, Italy

Continuation of Ser. No. 356,303, Mar. 10, 1982. This application Feb. 14, 1984, Ser. No. 579,287
Claims priority, application Italy, Mar. 16, 1981, 9364 A/81
Int. Cl.[4] G01F *15/00*; B01D *29/42*
U.S. Cl. 73—198 **6 Claims**

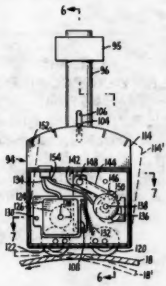


1. A double multiple change-over valve for connection to a resin column of a water treatment plant, said valve unit comprising a molded plastic body defining two cylindrical valve units, the cylindrical valve units being disposed parallel to each other and spaced apart by a connecting portion therebetween, each valve unit including a cylinder having an open end forming a port, the port of one of said cylinders forming an inlet port, the port of the other of said cylinders forming an outlet port, a movable assembly having a first and second ends slidable between first and second positions in said cylinder, piston means disposed at the first end of said movable assembly, said second end of said movable assembly including a first hollow cavity, lateral apertures disposed proximate said first hollow cavity and an open end for fluid communication between said first hollow cavity and said cylinder port, and an intermediate portion separate from said second end including a second hollow cavity having apertures through which fluid may flow, spacer and gasket means for forming annular throats about said movable assembly, said connecting portion of said valve body including transverse passage communicating with said annular throats, said connecting portion of said valve body including passages for fluid communication between said cylinders and said resin column, said connecting portion of said valve including concentric passages for connection to the top and bottom connections of the resin column, and said connecting portion of said valve body further including regenerating solution feeder passages for fluid communication with said resin column, said feeder passages including venturi means.

4,577,499
SLOPE-SPEED SENSOR FOR SEAM WELDING APPARATUS

Gerald W. Silke, El Cajon, and Frank D. Weber, Poway, both of Calif., assignors to Cyclomatic Industries, Inc., San Diego, Calif.

Division of Ser. No. 442,617, Nov. 18, 1982, abandoned. This application Jun. 18, 1984, Ser. No. 595,502
Int. Cl.[4] G01B *5/20, 9/00;* G01D *21/02;* G01P *4/00*
U.S. Cl. 73—432 R 11 Claims

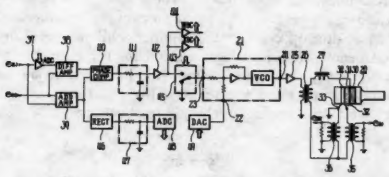


1. A slope/speed sensor for sensing slope and speed of an object comprising:
- a base,
- a mounting member,
- pivot means pivotally attaching said base to said mounting member, and
- slope sensing means on said base for contacting a workpiece and causing said base to be pivoted relative to said mounting member in proportion to the slope of the workpiece, and
- tachometer means for sensing and transforming surface speed of a workpiece into an electrical characteristic proportional to the surface speed.

4,577,500
DRIVING CONTROL METHOD OF ULTRASONIC TRANSDUCER

Shoji Mishiro, Kanagawa, Japan, assignor to Taga Electric Co., Ltd., Tokyo, Japan

Filed Aug. 1, 1984, Ser. No. 636,629
Claims priority, application Japan, Aug. 5, 1983, 58-143593
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—579 4 Claims

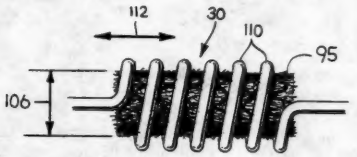


1. A driving control method for an ultrasonic transducer, comprising the steps of:
- measuring the transducer currents and determining the transducer current characteristics;
- locating the resonant points of the operation of said transducer based upon said current characteristics;
- determining the vibratory velocity detecting signal of said transducer based upon said transducer currents;
- determining the phase characteristics of said vibratory velocity detecting signal with respect to said transducer currents;
- determining the fundamental resonant point based upon the relationship of zero cross points of said phase characteristics with respect to the location and current value of said resonant point; and
- performing a phase lock-loop control oscillation to drive said transducer.

4,577,501
PROBE COIL SNUBBER

Tyag R. Sehgal, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed May 17, 1984, Ser. No. 611,277
Int. Cl.[4] F16F *1/00, 13/00, 7/00*
U.S. Cl. 73—577 3 Claims

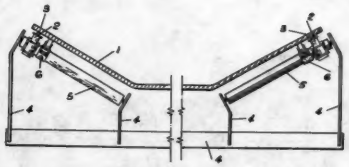


1. In the coil of a coiled tube in a gas turbine engine which provides a communication conduit leading to a sensor, the improvement comprising:
- a stiffening element contained within the coil for inhibiting bending of the coil.

4,577,502
CONVEYOR BELT MONITOR

Jock B. Cunningham, Mount Isa, Australia, assignor to Mount Isa Mines Limited, Queensland, Australia

Continuation-in-part of Ser. No. 390,665, Jun. 21, 1982, abandoned. This application Jun. 13, 1984, Ser. No. 620,015
Claims priority, application Australia, Jun. 29, 1981, PE9491
Int. Cl.[4] G01N *29/04*
U.S. Cl. 73—600 25 Claims

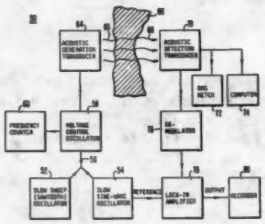


7. A method for detecting a rip in a conveyor belt comprising a rubber or rubberlike composition, the method comprising the steps of:
- (a) transmitting ultrasound of a particular frequency to the belt at a first zone;
- (b) detecting ultrasound of said particular frequency propagated by the belt from the first zone to a second zone spaced apart from the first; and
- (c) issuing a signal responsive to the intensity of ultrasound, if any, so detected, whereby said signal is indicative of discontinuities in the belt intermediate said zones.

4,577,503
METHOD AND DEVICE FOR DETECTING A SPECIFIC ACOUSTIC SPECTRAL FEATURE

Wayne I. Imaino, San Jose, and Andrew C. Tam, Saratoga, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 4, 1984, Ser. No. 646,406
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—602 **11 Claims**



1. A method of detecting a single spectral feature in the acoustic response of a sample under test, said method comprising the steps of:

providing an acoustical beam having a frequency bandwidth which is narrower than the width of the spectral feature, and having a center frequency f_c which lies near the feature;

modulating the acoustical beam with a single frequency f_s to provide a pure FM spectrum having upper and lower sidebands;

exposing the sample to the modulated acoustical beam so that only one of the FM sidebands probes the spectral feature; and

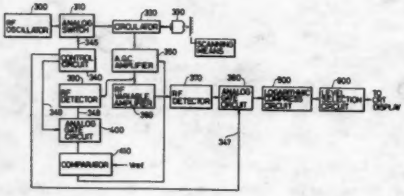
detecting the amplitude modulation (AM) of the acoustical beam emerging from the sample at the frequency f_s to determine

the strength of the spectral feature.

4,577,504
ACOUSTIC MICROSCOPE

Hiroshi Kanda, Tokorozawa, and Isao Ishikawa, Hino, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 19, 1984, Ser. No. 601,960
Claims priority, application Japan, Apr. 22, 1983, 58-69956
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—606 **2 Claims**



1. An acoustic microscope comprising:

an acoustic transducer which has a piezoelectric element and an acoustic lens;

a specimen holding means which holds a specimen in a manner to be opposed to said transducer via an acoustic propagation medium, the back surface of said specimen holding means being lined with a reflective material;

a drive means which drives said transducer in a pulse-like manner responsive to electric signals;

a receiving means which amplifies and detects reflected echoes that are detected by said transducer;

an AGC circuit means which samples an echo reflected from an interface between said acoustic lens and said acoustic propagation medium among said reflected echoes, and which controls the amplification factor of said receiving means such that the output thereof will reach a predetermined value;

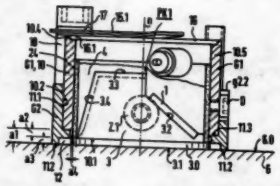
a sampling means which samples an echo reflected from said specimen among said reflected echoes; and

a display means which displays the echo sampled by said sampling means.

4,577,505
SPECIAL ANGLE BEAM PROBE FOR ULTRASONIC TESTING

Hans-Achim Jestrich, Ratingen, and Paul Friedrich, Uttenreuth, both of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Jul. 27, 1984, Ser. No. 634,990
Claims priority, application Fed. Rep. of Germany, Aug. 1, 1983, 3327736
Int. Cl.[4] G01N *29/04*
U.S. Cl. 73—629 **25 Claims**



1. Special angle beam probe for ultrasonic testing of a test piece, comprising a multiplicity of prefabricated beam probe subassemblies disposed on a surface of the test piece, said beam probe subassemblies each having a first housing, a wedge-shaped support body disposed in said first housing, at least one ultrasonic vibrator fastened to said support body, and damping means disposed in said first housing, and a multiplicity of second beam probe housings each surrounding a respective one of said beam probe subassemblies, said vibrators each delivering an ultrasonic beam striking a given point along the surface of the test piece at the same predetermined incidence angle other than 0° as measured from a perpendicular to the surface of the test piece at the given point, said beams arriving at the surface of the test piece at oblique angles between 0° and 360° subtended between a principal axis of the beam probe and said beam, as seen in direction perpendical to the beam probe from above, means for fastening said beam probe subassemblies at least at one different predetermined oblique angle in said second beam probe housings, and means for assembling said second beam probe housings with said beam probe subassemblies having the same incidence angle and different oblique angles with different oblique angle relationships.

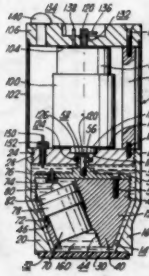
4,577,506
ULTRASONIC SCANNING PROBE

Michael J. Poole, Abingdon, and Michael J. Crook, Faringdon, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Jun. 5, 1984, Ser. No. 617,544
Claims priority, application United Kingdom, Jun. 24, 1983, 8317247
Int. Cl.[4] G01N *29/04*
U.S. Cl. 73—633 **8 Claims**

1. An ultrasonic scanning probe comprising, a casing having at one end an ultrasonically-transparent window, a block of

ultrasonically-absorbent material close-fitting within the casing and close to the window, having an axis of rotation which passes through the centre of the window and defining a hole extending from the window at an angle to the axis of rotation of the block, the fit being such as to define a narrow gap between the block and the casing of width not more than about 2 mm, a transducer mounted within the hole, an attenuating coupling medium filling the gap and the space between the transducer and the window, so as to scan a sector centred on the axis of rotation.



4,577,507

METHOD FOR THE ULTRASONIC TESTING OF DISCS SHRINK-FITTED ONTO SHAFTS IN VICINITY OF SHRINK-FITTED SEATS, AND APPARATUS FOR CARRYING OUT THE METHOD

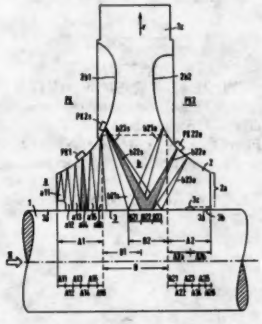
Hans-Achim Jestrich, Ratingen, and Ewald Werntgen, Mülheim, both of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed May 24, 1984, Ser. No. 613,902

Claims priority, application Fed. Rep. of Germany, May 24, 1983, 3318748

Int. Cl.⁴ G01N *29/04*

U.S. Cl. 73—640 **23 Claims**



15. Apparatus for the ultrasonic testing of disc bodies shrunk onto shafts, the disc bodies having shrink-fitted seats adjoining the shafts, a shrinkage influence zone adjoining the seats, hubs adjoining the shafts and having inner surfaces subdivided into test regions and subregions, wheel discs adjoining the hubs, a rim of the wheel discs, and side walls of the wheel discs having contours being tapered radially outwardly from the hub to the wheel disc rim as seen in cross section, comprising a manipulator, at least one manipulator arm having a free end and being attached to the manipulator, a portion of said arm being movable in and out and being movable and adjustable in at least axial and transverse to axial directions, different probe mountings interchangeably fastened to said free end of said manipulator arm, said mountings comprising templates, said templates having shapes adapted to the contour of the side wall in vicinity of a respective subregion, ultrasonic angle beam probes disposed on said templates, and measuring feelers disposed on said templates.

4,577,508

OPTICAL VIBRATION ANALYZER

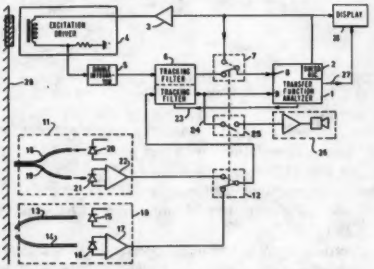
Russell Chaplin, Dibden Purlieu, United Kingdom, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 24, 1984, Ser. No. 664,139

Claims priority, application European Pat. Off., Oct. 25, 1983, 83306458.7

Int. Cl.⁴ G01H *9/00*

U.S. Cl. 73—655 **8 Claims**



1. An optical analyzer including a fiber optic probe having a predetermined field of view, characterized in that said analyzer further comprises:

means for illuminating with non-coherent light a limited area of a surface to be analyzed;

a light intensity detection device for producing a first electrical signal directly related to the intensity of light received by said fiber optic probe;

sweep oscillator means for providing an excitation signal to the surface to be analyzed;

means for connecting said first electrical signal and said excitation signal to inputs of a tracking filter which operates to eliminate background interference signals from said first signal; and

means for feeding the output of said tracking filter to an output monitor device,

whereby the vibration amplitude of the surface to be monitored is output to an output device.

4,577,509

ARRANGEMENT FOR DETERMINING THE TRAVEL OF A PISTON

Bernd Moser, Wissen, Fed. Rep. of Germany, assignor to Boge GmbH, Eitorf, Fed. Rep. of Germany

Filed Jun. 15, 1984, Ser. No. 621,075

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1983, 3321510; Aug. 30, 1983, 3331170

Int. Cl.⁴ G01R *27/26*

U.S. Cl. 73—658 **20 Claims**

1. A damping cylinder of a vibration damper, said damping cylinder having an arrangement for determining a position of piston means therewithin, said cylinder having a space therewithin with said piston means disposed in said space for axial slidable movement within said cylinder;

at least one damping medium being disposed within said cylinder for damping said axial movement of said piston means with respect to said cylinder;

said arrangement for determining the position of said piston means comprising:

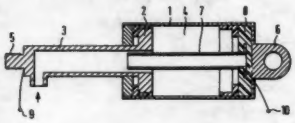
means for sensing a position of said piston means within said cylinder;

said position sensing means having a first element and a second element;

said first element of said position sensing means being disposed to be movable with said piston means;

said second element of said position sensing means being disposed to be substantially stationary with respect to said cylinder;

said first element and said second element being electrical insulated one from the other;



said two elements forming a variable impedance component which is substantially electrically reactive;

and wherein said variable reactive electrical impedance varies, in operation, with said position of said piston means in said cylinder;

an electrical signal generated by at least one of said elements and being indicative of said position of said piston means; and

electrical connecting means, connected to at least one of said elements, for sensing said electrical signal, indicative of said position of said piston means.

4,577,510

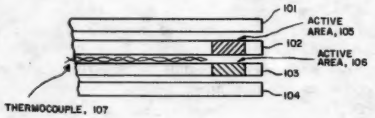
DYNAMIC POLYMER PRESSURE TRANSDUCER WITH TEMPERATURE COMPENSATION

Anthony J. Bur, Rockville, and Steven C. Roth, Frederick, both of Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 6, 1984, Ser. No. 647,782

Int. Cl.[4] G01L *9/08;* G01K *7/10*

U.S. Cl. 73—708 **9 Claims**



1. A pressure gage used to obtain accurate dynamic pressure data in a changing thermal environment, comprising:

an active transducer producing a transducer output signal which is uncorrected for thermal effects, said active transducer being composed of polyvinylidene fluoride;

a thermocouple having a short rise time and producing an output thermal signal which dynamically responds to changing thermal conditions, said thermocouple being a copper-constant thermocouple made with wire, said thermocouple residing within said transducer; and

a compensation means receiving said transducer output signal from said transducer and said output thermal signal from said thermocouple, said compensaton means producing a corrected pressure signal, said corrected pressure signal representing accurate pressure data which is corrected for changing thermal conditions.

4,577,511

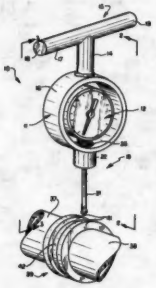
AIR LINE PRESSURE TESTER

Donald C. Wetzel, c/o Quest Corporation, 9009 Freeway Dr., Macedonia, Ohio 44056

Filed Nov. 5, 1984, Ser. No. 667,971

Int. Cl.[4] G01L *19/14*

U.S. Cl. 73—756 **11 Claims**



1. A device for determining air pressure in an air line at a hose coupling thereon having a pair of connectors containing resilient gaskets on the ends of the hoses in sealing engagement with each other, said device comprising:

means for gauging air pressure;

a protective member supporting said gauge means therein;

means for sampling air pressure in the air line, said sampling means being mounted on said protective member and extending outwardly therefrom, having a distal portion adapted to pass between said gaskets at a sealing interface thereof and into said air line, said sampling means providing fluid communication between said air line and said gauge means;

handle means on said protective member, said handle means and protective member coacting a transfer a force applied on said handle means to said sampling means to position said distal portion in fluid communication with said air line without the force being applied to said gauging means.

4,577,512

THREAD-TENSION METER

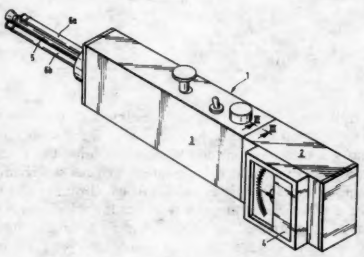
Konrad Löwenheck, Basel, Switzerland, assignor to N. Zivy & Cie, S.A., Oberwil, Switzerland

Filed Aug. 20, 1984, Ser. No. 642,206

Claims priority, application Switzerland, Sep. 21, 1983, 5134/83

Int. Cl.[4] G01L *5/04;* G01D *11/24*

U.S. Cl. 73—862.45 **2 Claims**



1. A thread-tension meter comprising

a housing consisting of a main portion and an end portion,

a device projecting from the main portion of the housing and intended for sensing the thread tension,

mechanical and electronic equipment, cables and accessories arranged within the housing for measuring the thread tension, and

an indicator device located in the end portion of the housing for reading off the measured value,

wherein the end portion of the housing in which the indicator device is located is self-contained,

wherein the end portion is pivotable at least 45° relative to the main housing portion,

wherein a bushing extends through the end wall of the end portion of the housing and the adjacent end wall of the main housing portion and serves as a pivot bearing and cable duct,

wherein the end wall of the end portion of the housing adjacent the main housing portion is pressed by means of spring pressure against the adjacent end wall of the main housing portion, and

wherein an annular tensioning spring on the periphery of the bushing is adjustable by means of a nut screwed onto the bushing.

4,577,513

STRAIN SENSING ARRANGEMENT

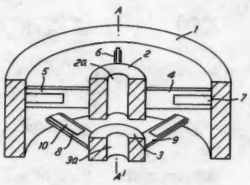
Alan R. Harwood, Hayes, and Julie A. Ward, Camberley, both of England, assignors to EMI Limited, Hayes, England

Filed Nov. 2, 1983, Ser. No. 547,899

Claims priority, application United Kingdom, Nov. 9, 1982, 8231907

Int. Cl.⁴ G01L *5/16, 1/22*

U.S. Cl. 73—862.04 **7 Claims**



1. A strain sensing arrangement comprising

a first support member,

two further support members arranged coaxially with respect to the first support member,

a first array of beam members interconnecting said first support member and one of said further support members,

a second array of beam members interconnecting said first support member and the other of said further support members, and respective strain sensing means associated with the beam members of the first and second arrays for sensing relative axial displacement of the first support member and said one of the further support members and relative angular displacement of the first support member and said other of the further support members and for generating electrical signals indicative of angular and/or axial displacements which are sensed.

4,577,514

METHOD AND APPARATUS FOR SAMPLING LIQUID PHASE COMPONENTS FROM A LIQUID-SEMISOLID FLUID

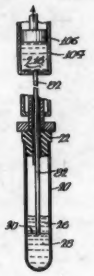
Charles A. Bradley, Brentwood; Herman Benge, Nashville; Fritz F. Parl, Nashville, and William R. Seebaugh, Nashville, all of Tenn., assignors to Vanderbilt University, Nashville, Tenn.

Filed Apr. 9, 1984, Ser. No. 598,074

Int. Cl.⁴ G01N *1/18, 33/48*

U.S. Cl. 73—863.01 **19 Claims**

1. Apparatus for isolating liquid phase components from semisolid phase components of a fluid mixture of the type in which the liquid phase components overlie the semisolid phase components and a liquid-semisolid interface is defined therebetween, comprising a probe; means for moving an end of said probe into and through the liquid phase components and toward and to the interface; means on said probe for sensing a change in pressure on said end of said probe upon said end contacting the interface and for generating a signal in response



thereto; means for terminating movement of said probe upon generation of said signal, said probe having an opening therein close to but spaced from said end thereof so that said opening is located close to but spaced from the interface and entirely in the liquid phase components when said end reaches the interface; and means for withdrawing liquid phase components through said opening and probe after termination of movement of said probe.

4,577,515

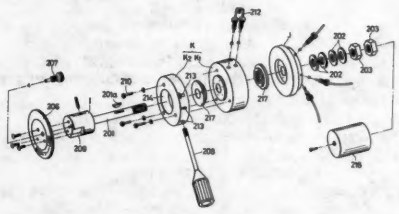
SAMPLING VALVE FOR USE IN HIGH-SPEED LIQUID CHROMATOGRAPHY

Noboru Someya, Chiba, and Rikizo Horikawa, Toyama, both of Japan, assignors to Tokyo Rika Kikai Co., Ltd., Japan

Filed Jun. 19, 1984, Ser. No. 622,151

Int. Cl.⁴ G01N *1/10, 30/20*

U.S. Cl. 73—863.73 **2 Claims**

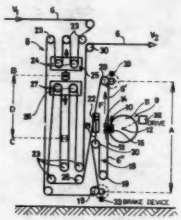


1. A sampling valve for use in a high-speed liquid chromatography comprising a first stator having therein a sample injection flow passage and a solution flow passage; a second stator having therein a solution flow passage and a discharge passage; a rotor having therein three or more sample holding bores of different diameter, said rotor being rotatably interposed between said first and second stators; and an axial shaft fixed between said stators, said axial shaft extending through said rotor in such a manner as to allow said rotor to rotate; either one of said stators or said shaft being provided with a length of engaging groove adapted to engage with a front end of a lever for rotating said rotor; a plurality of mounting holes being provided in such a positions as to permit the adjustment of the angular position of said rotor.

4,577,516
DEVICE FOR TAKING A SAMPLE FROM A CONTINUOUSLY ADVANCING WEB

Johann Wyser, Ligerz, Switzerland, assignor to Stork Brabant B.V., An Boxmeer, Netherlands

Filed Jun. 4, 1984, Ser. No. 617,278
Claims priority, application Netherlands, Jun. 17, 1983, 8302175
Int. Cl.[4] G01N *1/04*
U.S. Cl. 73—864.41 8 Claims

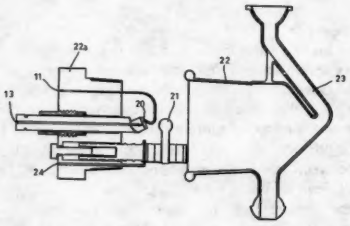


1. A device for taking a sample from a continuously advancing web which is subsequently continuously discharged, the device comprising means for bringing about a temporary stop zone for the web, said stop zone means comprising a combination of a first accumulator and a second accumulator for storing the supplied web, and a web supporting surface movably disposed at one side near the stop zone and positioned between said first and second accumulators, said stop zone means cooperating with sample taking means, and sample taking means comprising means for temporarily retaining the web; means for cutting the temporarily retained web twice thereby dividing said web into a first portion having a cut end, a second portion having a cut end, and a relatively small sample portion; and means for rejoining the first and second portions, the means for temporarily retaining the web comprising two fixed suction bars provided on the side of the web opposite the side adjacent to the web supporting surface, and a third suction bar provided on said web supporting surface, said cutting means being movable between the two fixed suction bars.

4,577,517
NEBULIZER

Trevor V. Knight, Albany Creek, Australia, assignor to Labtest Equipment Co. (S.E. Asia) Pty. Ltd., Braeside, Australia

PCT No. PCT/AU83/00120, § 371 Date Apr. 27, 1984, § 102(e) Date Apr. 27, 1984, PCT Pub. No. WO84/00906, PCT Pub. Date Mar. 15, 1984
PCT Filed Aug. 30, 1983, Ser. No. 609,566
Claims priority, application Australia, Aug. 30, 1982, PF5631; Jul. 25, 1983, PG0459
Int. Cl.[4] G01N *35/00*
U.S. Cl. 73—864.81 15 Claims

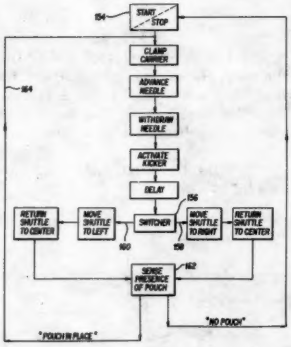


1. A nebulizer assembly including a sample liquid inlet; an interface to which said sample liquid may be introduced for forming into an aerosol; actuating means cooperable with said interface to form said aerosol; decontamination means operable to substantially reduce contamination of said interface; a cloud chamber for containing said aerosol; an aerosol sample outlet from said cloud chamber; and purging means for purging said cloud chamber of said aerosol.

4,577,518
GAS SAMPLING DEVICE

Wing C. Fong, Scarborough; Albert J. Fournier, Ajax, and Bernard B. Gil, Brampton, all of Canada, assignors to The Government of Canada, Ottawa, Canada

Filed Jan. 3, 1985, Ser. No. 688,222
Claims priority, application Canada, Jan. 9, 1984, 444910
Int. Cl.[4] G01N *1/14, 1/22*
U.S. Cl. 73—864.91 3 Claims



1. Apparatus for injecting samples of a fluid into sealed pouches of a type having a self-sealing portion, the apparatus comprising:

a framework;

an injection needle for coupling to a source of said fluid to supply fluid to the pouches;

a drive mechanism attached to the framework and coupled to the injection needle and operable to move the needle between a withdrawn position and an engagement position along a first line of travel;

a hopper attached to the framework for containing the pouches in a stack;

a transport mechanism attached to the framework and having a shuttle moveable along a second line of travel at right angles to the first line of travel for moving pouches one at a time from the hopper to a position in line with the needle to receive said samples from the needle with the needle in the engagement position;

ejection means coupled to the framework and operable to push the pouches off the shuttle to make space for another one of the pouches from the hopper; and

control means coupled to activate the drive mechanism, transport mechanism, and ejection means sequentially to position the shuttle at the hopper to receive the pouches, to move the shuttle to bring one pouch at a time in line with the needle, to move the needle to the engagement position to provide a sample in this pouch, to move the needle to the withdrawn position, to push the pouch off the shuttle, and to then move the shuttle into position to receive another one of the pouches contained in the hopper before repeating the steps to place a sample in said another one of the pouches.

4,577,519
GYROSCOPE LOAD CELL

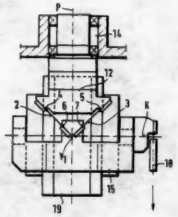
Hans W. Häfner, Aichach, Fed. Rep. of Germany, assignor to Pfister GmbH, Fed. Rep. of Germany

Filed Jun. 17, 1983, Ser. No. 505,345

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1982, 3227497

Int. Cl.⁴ G01L *1/00*

U.S. Cl. 74—5 F **4 Claims**



1. A gyroscope load cell comprising:

a housing,

an inner gimbal and an outer gimbal arranged in said housing,

a gyroscope arranged to rotate about a gyroscope axis and suspended in said housing by means of said outer and inner gimbals such that the precessional motion of said gyroscope about its precessional axis is proportional to the force to be measured when applied to said inner gimbal, and

a link joint comprising a pair of straps having first ends connected to the outer gimbal at points located at a distance to each other in an essentially horiztonal plane and at equal distances from said precessional axis, said straps having their second ends connected to a common point on the inner gimbal, said common point being located at the intersection of said precessional axis and said gyroscope axis.

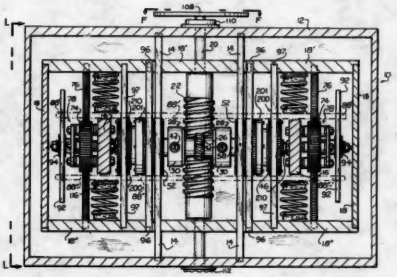
4,577,520
MECHANICAL PROPULSION SYSTEM

Joseph Colla, 730 Santa Susana St., Sunnyvale, Calif. 94086

Continuation-in-part of Ser. No. 685,333, Dec. 24, 1984, abandoned, which is a continuation-in-part of Ser. No. 426,261, Sep. 29, 1982, abandoned, which is a continuation-in-part of Ser. No. 403,555, Jul. 30, 1982, abandoned. This application Jun. 26, 1985, Ser. No. 749,188

Int. Cl.⁴ F16H *33/20*

U.S. Cl. 74—84 R **1 Claim**



1. A mechanical propulsion sytem comprising:

(a) a support structure having a thrust axis;

(b) rack means attached to said support structure parallel to said thrust axis;

(c) a load carriage coupled to said rack means for forward or reverse movement with recoil action parallel to said thrust axis;

(d) a power carriage coupled to said load carriage for independent forward or reverse movement parallel to said thrust axis;

(e) transverse drive means having an axis of rotation substantially perpendicular to said thrust axis and engaging said rack means, said load carriage, and said power carriage;

(f) means for storing potential energy developed by the relative motion of said load carriage and said power carriage; and

(g) means for powering said transverse drive means such that energy that is not stored by said means for storing potential energy is converted into a thrust force on said rack means.

4,577,521
CARRIAGE DRIVE UNIT

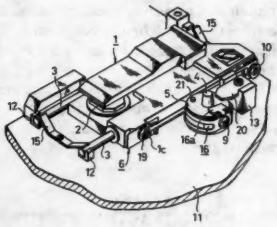
Makito Takikawa, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Jun. 13, 1984, Ser. No. 620,014

Claims priority, application Japan, Jun. 13, 1983, 58-89075[U]

Int. Cl.⁴ F16H *21/44*

U.S. Cl. 74—89.2 **7 Claims**



1. A carriage drive unit comprising:

(a) a carriage;

(b) guide means for guiding said carriage;

(c) a drive motor having a rotatable shaft;

(d) a pulley fixed to said rotatable shaft of said drive motor;

(e) a drive belt having a looped portion extending around and fixed by a screw on a peripheral surface of said pulley and having end portions fastened to said carriage for moving said carriage along said guide means in response to rotation of said pulley; and

(f) a resilient member disposed between said peripheral surface of the pulley and said drive belt for normally urging said looped portion of the drive belt radially outwardly, said resilient member being elastically deformable under pressure, of said screw toward said peripheral surface of the pulley.

4,577,522
TORSIONAL THRUST TOOL

James D. Cox, Jr., 250 Morrison Canyon Rd., Fremont, Calif. 94538

Filed Jun. 19, 1984, Ser. No. 622,268

Int. Cl.⁴ F16H *27/02, 31/00*

U.S. Cl. 74—127 **4 Claims**

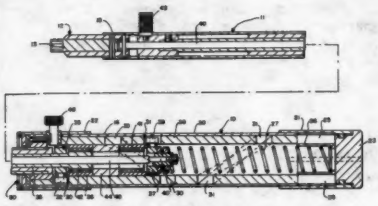
1. A reversible rotary torque-producing tool comprising:

a. an elongated cylindrical handle;

b. a cylindrical housing located completely within and concentric to said handle, said housing being fixed against relative motion with respect to said handle, having first and second helical slots in the cylindrical surface thereof with said slots being axially displaced from one another, with said first slot defining a right hand helix and said second slot defining a left hand helix each of said slots

extending substantially 360° around said housing and with the end of said first slot being intermediate the ends of said second slot;

c. a tool-operating shaft located within and concentric to said housing, said tool-operating shaft
1. being journaled for rotating around its long axis,
2. having a large diameter clutch-engaging part,
3. having a small diameter part,
4. having an extending part extending beyond said handle



d. first drive means including a first clutch that grips in one direction of rotation and second drive means including a second clutch that grips in a direction of rotation opposite said one direction, said first drive means engaging said first helical slot and said second drive means engaging said second helical slot;

e. shift means for selectively positioning said large diameter clutch-engaging part within one of said drive means; and

f. a closure surrounding said extending part and enclosing said housing within said handle.

4,577,523

SILICONE TRACTION FLUIDS

Eugene D. Groenhof, Freeland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Nov. 28, 1983, Ser. No. 555,757
Int. Cl.⁴ F16H *15/08*
U.S. Cl. 74—200 **28 Claims**

1. In a traction drive system having at least two relatively rotatable members in a torque transmitting relationship and a traction fluid disposed on the tractive surfaces of said members, the improvement comprising employing, as said traction fluid, a fluid consisting essentially of a polyorganosiloxane fluid which contains 7 to 45 weight percent siloxane units of formula $[RSiO_{3/2}]$, 40 to 90 weight percent siloxane units of formula $[R_2SiO]$, and 0 to 20 weight percent siloxane units of formula $[(CH_3)_3SiO_{\frac{1}{2}}]$, where the molar ratio of $[(CH_3)_3SiO_{\frac{1}{2}}]$ siloxane units to $[RSiO_{3/2}]$ siloxane units in said polyorganosiloxane fluid is less than 1, where R is independently selected from the group consisting of methyl, cyclohexyl, and phenyl radicals, and where said polyorganosiloxane fluid has a kinematic viscosity of about 20 to 200 centistokes at 77° F.

4,577,524

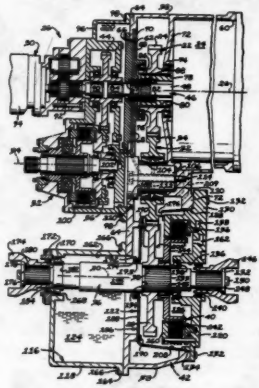
VEHICLE TRANSFER GEAR AND DRIVE LINE BRAKE MECHANISM

David L. Richards, Peoria, and Willis E. Windish, Pekin, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US82/00832, § 371 Date Jun. 18, 1982, § 102(e) Date Jun. 18, 1982
PCT Filed Jun. 18, 1982, Ser. No. 601,772
Int. Cl.⁴ F16H *57/04, 57/10*
U.S. Cl. 74—411.5 **17 Claims**

1. In a vehicle transfer gear and drive line brake mechanism including a depending gear transfer train and a drive line brake assembly for respectively propelling and stopping movement of a vehicle, the gear transfer train having an output gear connected to an output shaft disposed on a lower axis and the drive line brake assembly being connected to the output shaft and disposed on the lower axis, the improvement comprising:

housing means for defining an enclosed compartment containing the gear transfer train and the drive line brake assembly in juxtaposed relation and a common lubrication fluid therein, the housing means including a main case defining an opening on the lower axis; and



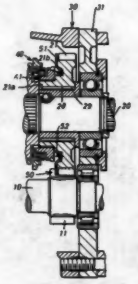
the drive line brake assembly including a brake body releasably secured to the case in closing relationship to the opening and a plurality of annular plates and discs, the drive line brake assembly being modularized and being removable with the brake body from the output shaft independent of the output gear.

4,577,525

GEAR ASSEMBLY FOR AUTOMOBILE TRANSMISSION

Kazuhito Ikemoto; Yukio Terakura, and Takashi Miyake, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Dec. 6, 1982, Ser. No. 447,188
Claims priority, application Japan, Dec. 23, 1981, 56-208530
The portion of the term of this patent subsequent to Jul. 23, 2002, has been disclaimed.
Int. Cl.⁴ F16H *55/18*
U.S. Cl. 74—440 **3 Claims**



3. In a gear assembly including having a pair of driving and driven gears permanently in meshing engagement with each other to provide a torque transmission therebetween, said driven gear being formed at one side thereof with a boss portion, and an additional gear axially slidable and rotatable on the boss portion of said driven gear and being permanently in meshing engagement with said driving gear to rotate at a gear

ratio different from that of said driving and driven gears, and in which said additional gear is resiliently in contact with a synchronizer mechanism assembled adjacent to said additional gear and having a spline piece fixed to the boss portion of said driven gear, and resilient means for resiliently pressing said additional gear against one end face of said driven gear to restrain a relative rotation between said driving and driven gears.

the improvement wherein a toothed portion of said driven gear is formed at one end thereof with an annual stepped portion for provision of a predetermined annular gap between said additional gear and the one end face of the toothed portion of said driven gear, and wherein said resilient means is a waveshaped ring spring arranged in surrounding relationship with the boss portion of said driven gear and is engaged at its one end face with said additional gear and at its other end face with the spline piece of said synchronizer mechanism.

4,577,526

PROTECTIVE ELEMENT FOR HAND-HELD POWER TOOL

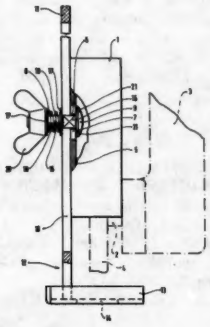
Manfred Stäbler, Echterdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 5, 1984, Ser. No. 586,094

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1983, 8308464[U]

Int. Cl.⁴ F16P *1/00*; B24B *55/04*

U.S. Cl. 74—609 **8 Claims**



1. A protective element for a hand-held power tool with a rotary tool, such as a grinding disk, a circular saw, or the like, comprising a protective member provided with a plurality of elongated cut-outs each having two ends spaced from one another in the direction of elongation and provided in one of said ends with an increased portion; an additional member connectable with said protective member; and means for connecting said additional member with said protecting member, said connecting means including a plurality of holding screws having heads arranged to be inserted from outside through said increased portions and engage behind said protective member, said increased portions of said cut-outs having a shape on a plan view which corresponds to the shape of said heads of said screws and being provided at the same ends of said cut-outs in said protective member, and at least one locking projection, which projects outwardly beyond said protective member and is arranged near at least one of said increased portions in a path of an associated one of said heads sliding on said protective member in a respective one of said cut-outs from said one end to said other end of each of said cut-outs and vice versa so that when the head of one of said holding screws is inserted through the increased portion of respective one of said cut-outs said head is located at one side of said locking projection, and after said head has been slid to the other end of the same cut-out said head is located at the other side of said locking projection.

4,577,527

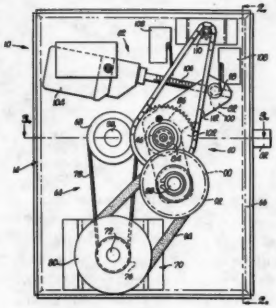
DIFFERENTIAL DRIVE MECHANISM

Michael L. Shackelford, Emporia, Kans., assignor to Didde Graphic Systems Corporation, Emporia, Kans.

Filed Oct. 24, 1983, Ser. No. 544,514

Int. Cl.⁴ F16H *33/00*

U.S. Cl. 74—640 **12 Claims**



1. A drive mechanism for operably connecting an input shaft and an output shaft for varying the rotational velocity of the output shaft relative to the rotational velocity of the input shaft, said drive mechanism comprising:

pulley means operably coupled to said input shaft for rotation therewith;

arm means operably mounted for pivotal movement about the axis of rotation of said output shaft;

variable sheave means operably mounted to said arm means and rotatable about an axis spaced from the axis of rotation of said output shaft;

means operably interconnecting said pulley means and said variable sheave means for rotating said variable sheave means in response to rotational movement of said pulley means;

means operably coupling said variable sheave means and said output shaft for rotating said output shaft in response to rotational movement of said variable sheave means; and

positioning means operably connected to said arm means for pivoting said arm means thereby changing the rotational velocity of said variable sheave means when the position of said variable sheave means is changed and effecting a corresponding change in the rotational velocity of said output shaft.

4,577,528

DRIVING/TURNAROUND DEVICE FOR A REMOTE CONTROLLED TOY VEHICLE

Tuneo Hanzawa, Tokyo, Japan, assignor to K. K. Hanzawa Corporation, Tokyo, Japan

Filed Dec. 31, 1984, Ser. No. 687,591

Claims priority, application Japan, Sep. 14, 1984, 59-140319

Int. Cl.⁴ F16H *5/72*; A63H *17/36*

U.S. Cl. 74—665 GA **1 Claim**

1. A driving/turnaround device in use with a remote controlled toy vehicle comprising:

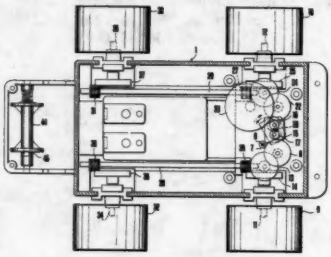
a reversible motor rotatable in a forward direction or a backward direction in response to a command applied from a remote controller;

an intermediate gear being in mesh with a gear rotated by said motor;

a pair of axles being independently provided for right and left driving wheels, and rotatably supported by a car body;

said intermediate gear being in mesh with a gear for transmitting a drive force to one of said axles;

a rectilinear movement gear like said intermediate gear and a turnaround reduction gear being in mesh with a gear for transmitting a drive force to the other of said axles;



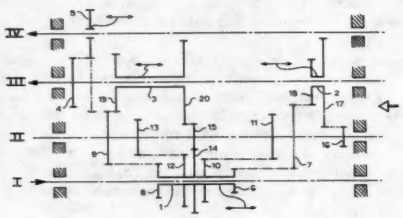
a swing member rotatably mounted to said car body being provided with a pair of switch gears meshing with each other, said swing member being swung so that one of the pair of said switch gears meshes with said intermediate gear, while the other is in mesh with said rectilinear movement gear in the forward rotation, and is meshed with said reduction gear in the reverse rotation.

4,577,529

GEAR TRANSMISSION ASSEMBLY

Romeu Romi, Av. Perola Byington 56, Santa Barbara d'Oeste C., Brazil

Filed Aug. 30, 1982, Ser. No. 412,852
Int. Cl.⁴ F16H *37/06*
U.S. Cl. 74—665 GA **10 Claims**



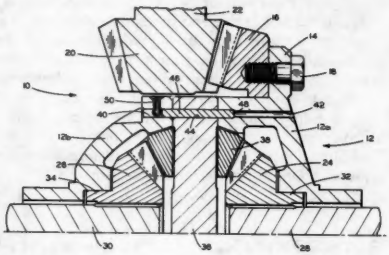
1. A gear transmission assembly, comprising a speed change gearbox including a drive shaft, an intermediate shaft, set of five slideable gears for driving said intermediate shaft from said drive shaft, a first driven shaft, two slideable double gears constrained for rotation with said first driven shaft, a secondary driven shaft with a 1:1 gear ratio in relation to said first driven shaft and another gear ratio, a multiple of 2 in relation to the first driven shaft, six non-slideable gears constrained for rotation with said intermediate shaft of which four non-slidable gears are selectively meshable with corresponding sliding gears on said drive shaft and with corresponding double gears slideable on said first driven shaft, a slideable gear constrained for rotation with said secondary driven shaft and alternatively meshable with one of said four non-slideable gears constrained for rotation with said intermediate shaft, and said gears constrained for rotation with said drive, said intermediate shaft and said first driven shaft producing 17 different output speeds on said first driven shaft.

4,577,530

DIFFERENTIAL CROSS SHAFT RETAINING MEANS

John L. Hickey, Fort Wayne, Ind., assignor to Dana Corporation, Toledo, Ohio

Filed Feb. 24, 1984, Ser. No. 582,395
Int. Cl.⁴ F16H *1/40*
U.S. Cl. 74—713 **9 Claims**



1. In a differential axle assembly having a rotatable casing enclosing side gears cooperating with pinion gears mounted on a cross shaft, the improvement comprising:

a rotatable casing having a casing channel formed therein;

a cross shaft supported in openings formed in said rotatable casing and having a cross shaft channel formed therein adapted to be aligned with said casing channel;

lock pin means disposed in said cross shaft channel and said casing channel for retaining said cross shaft within said casing;

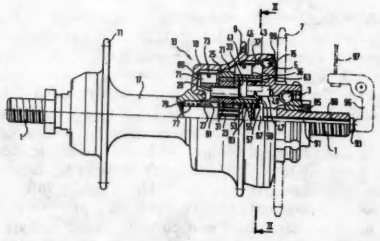
boss means attached to said casing and extending transversely into said casing channel adapted to retain said lock pin means therein.

4,577,531

MULTI-RATIO DRIVE HUB FOR BICYCLES WITH AT LEAST THREE DIFFERENT DRIVE TORQUE PATHS

Eduard Bergles, Graz, Austria, assignor to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Mar. 2, 1984, Ser. No. 585,891
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1983, 3307820; Feb. 28, 1984, 3407164
Int. Cl.⁴ F16H *3/44, 57/10*
U.S. Cl. 74—781 B **14 Claims**



1. In a multi-ratio drive hub having at least three gears, for bicycles, comprising

(a) a hub spindle;

(b) a driver carrying at least one chain wheel and mounted rotatably on the hub spindle;

(c) a hub sleeve carrying two spoke flanges and mounted rotatably on the hub spindle for one part and the driver on the other;

(d) a planetary gearing enclosed by the hub sleeve and the driver, including

a sun wheel having external toothing, arranged non-rotatably on the hub spindle,

an internally toothed hollow wheel rotatable about the hub spindle in relation to the hub sleeve,

a planet wheel carrier rotatable about the hub spindle in relation to the hub sleeve, and

at least one planet wheel meshing with the sun wheel and the hollow wheel and mounted rotatable on the planet wheel carrier;

(e) controllable coupling elements which couple the driver with the hub sleeve through one of at least three drive torque paths according to choice, a first of the drive torque paths leading from the driver by way of the hollow wheel to the planet wheel carrier and thence to the hub sleeve, a second of the drive torque paths leading from the driver parallel with the planetary gearing to the hub sleeve and a third of the drive torque paths leading from the driver by way of the planet wheel carrier to the hollow wheel and thence to the hub sleeve,

(f) a control device displaceable manually axially in relation to the hub spindle for the control of the coupling elements;

(g) a free wheel coupling in at least one of the drive torque paths,

(h) the improvement comprising forming each of the controllable coupling elements which switch the drive torque paths as a controllable pawl ratchet with a pawl toothing in each case, at least one pawl in each case engaging under resilient initial stress in the pawl toothing and a control element in each case, said pawl or pawls and the control element of each pawl ratchet being axially displaceable in relation to one another by means of the control device in such a way that the control element in a first relative position holds the pawl or pawls liberated for resilient engagement in the pawl toothing and in a second relative position holds the pawl or pawls lifted out of the pawl toothing, a first controllable pawl ratchet is arranged in a drive torque path from the hollow wheel to the hub sleeve and a second controllable pawl ratchet is arranged in a drive torque path from the driver to the planet wheel carrier, the control element of the second controllable pawl ratchet comprises an annular lift-out ramp and is displaceable in relation to the hub spindle by means of the control device, and the pawl toothing of the second controllable pawl ratchet is formed as external pawl toothing of an annular part connected non-rotatably with the planet wheel carrier and the driver is formed as pawl carrier of the pawl or pawls of the second controllable pawl ratchet.

4,577,532

AUTOMATIC DEVICE FOR ADVANCEMENT OF REVOLVING MECHANICAL ORGANS

Walter Cavalli, Villanova di Castenaso, Italy, assignor to O.M.C. s.n.c. di Walter & Dante Cavalli, Villanova di Castenaso, Italy

Filed May 22, 1984, Ser. No. 612,920

Claims priority, application Italy, May 30, 1983, 3443 A/83

Int. Cl.[4] F16H *35/00*

U.S. Cl. 74—841 **5 Claims**

1. A device for automatic advance of a rotating tool towards a workpiece, said tool including a cutting tool, comprising:

(a) a rotating tool holder for holding said cutting tool for operation on said workpiece;

(b) a gear wheel bearing against said rotating tool holder toward said workpiece;

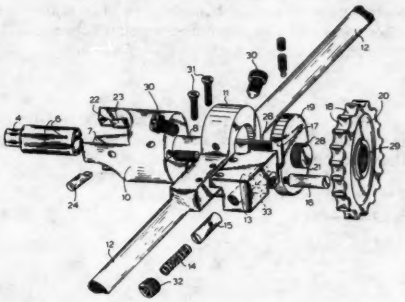
(c) holding means secured to said workpiece for holding said gear wheel with respect to said workpiece;

(d) means associated with said rotating tool holder for engaging said gear wheel and rotating the same as said tool holder rotates;

(e) means associated with said holding means and said gear wheel for advancing said gear wheel towards said workpiece as said gear wheel rotates; and

(f) a stop motion means associated with said gear wheel and said rotating tool holder for stopping the rotational movement of said gear wheel, said stop motion means comprising:

a non-rotatable cam which operates on said gear engaging



means associated with said rotating tool holder to disengage said gear engaging means from said gear wheel, stopping the rotating movement thereof during a segment of the rotation of said tool holder.

4,577,533

ADJUSTING MECHANISM FOR A GRINDING WHEEL ON A SHARPENING MACHINE FOR SAWS

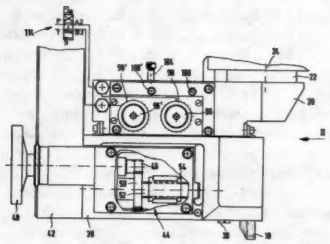
Peter Lenard, Biberach an der Riss; Erich Pokorny, and Norbert Bailer, both of Schemmerhofen, all of Fed. Rep. of Germany, assignors to Vollmer Werke Maschinenfabrik GmbH, Biberach an der Riss, Fed. Rep. of Germany

Filed May 1, 1984, Ser. No. 605,928

Claims priority, application Fed. Rep. of Germany, May 10, 1983, 3317085

Int. Cl.[4] B23D *63/14*

U.S. Cl. 76—41 **5 Claims**



1. An adjustment mechanism for a grinding wheel on a sharpening machine for workpieces, such as saws, comprising:

a carrier member reciprocable in a first direction;

a carriage mounted on said carrier member for movement relative to said carrier member in a second direction which is transverse to said first direction;

bearing means supported on said carriage for movement relative thereto in said second direction;

a shaft rotatably carried by said bearing means for rotation about an axis extending in said second direction;

a grinding wheel carried by said shaft so as to be rotatable with said shaft about said axis;

front and back end stops arranged to limit the reciprocal stroke of said carriage toward and away from a workpiece;

drive means for reciprocating said carriage between said front and back end stops in a predetermined timed relationship with movement of said carrier member;

at least one intermediate stop movable from a retracted position to an operative position between said front and back end stops for limiting the extent of said reciprocable stroke of said carriage; and

control means responsive to movements of said carrier member for moving said intermediate stop between said retracted position and said operative position.

4,577,534

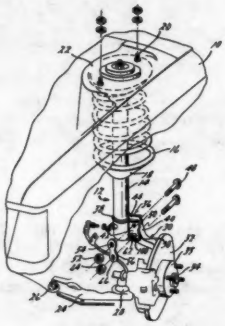
FRONT SUSPENSION ALIGNMENT TOOL

Joseph Rayne, Clinton, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Apr. 1, 1985, Ser. No. 718,765

Int. Cl.[4] B25B *27/00, 13/48*

U.S. Cl. 81—484 **2 Claims**



1. A tool comprising a cylindrical socket having its one end formed with handle attachment means and its other end formed with a bolt head receiving recess having flat wall portions adapted to drivingly engage a head of a bolt with which the tool is to be used, said recess end having an eccentric cam portion thereon, said eccentric cam portion defining a cylindrical cam surface having its radius of curvature offset a defined distance from the principal axis of said socket, said cylindrical cam surface adapted to be positioned in cammed engagement with raised guide surfaces adjacent slot means in a first structural member, a second stationery structural member having a through bore aligned with said first structural member slot means, the through-bolt adapted to extend through the first structural member slot means and the second structural member through bore, whereby upon rotation of the socket causing threaded turning of the through-bolt, the first structural member is moved along the slot means relative to the second structural member and the through-bolt to achieve selected adjustment of the first structural member relative to the second structural member within the range of movement permitted by said slot means.

4,577,535

CONTOURING MACHINE WITH RADIAL SLIDE HEAD

Steven E. Klabunde; Edward H. Hankwitz, and Charles Maastricht, all of Fond du Lac, Wis., assignors to AMCA International Corporation, Hanover, N.H.

Filed Jun. 3, 1982, Ser. No. 384,744

Int. Cl.[4] B23B *3/12*

U.S. Cl. 82—2 E **15 Claims**

1. A numerically controlled contour boring machine adapted for interior and exterior machining operations and comprising, in combination:

(a) a machine base;

(b) a numerical control;

(c) a headstock mounted for sliding movement along a first axis and having drive means actuated by said numerical control for effecting such movement;

(d) means connected with said numerical control for continuously sensing the precise position of said headstock along said first axis;

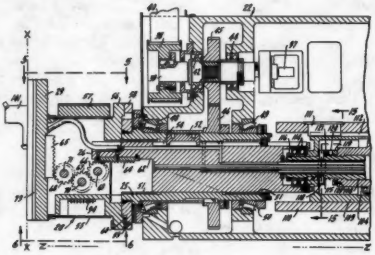
(e) a spindle sleeve journaled within said headstock and having drive means actuated by said numerical control for rotating same;

(f) a spindle housed within said spindle sleeve and adapted for axial sliding movement with respect to said sleeve;

(g) a mounting flange fixed to one end of said spindle sleeve;

(h) a contouring head fixed to said mounting flange;

(i) a radial tool slide in said contouring head movable along a second axis;



(j) drive means actuated by said numerical control for feeding said spindle axially toward and away from said contouring head;

(k) gear connection means interposed between said spindle and said radial slide for positioning same along said second axis in response to said axial feeding motion of said spindle;

(l) means for eliminating perceptible backlash from said gear connection means;

(m) means connected with said numerical control for continuously sensing the precise position of said radial tool slide along said second axis;

(n) whereby said machine is adapted to execute a machining sequence with said contouring head.

4,577,536

FEED APPARATUS FOR AUTOMATIC LATHES

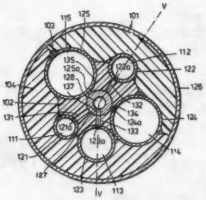
André Lechot, Orvin, and Alexandre Louis, Le Landeron, both of Switzerland, assignors to LNS, S.A., Berne, Switzerland

Continuation of Ser. No. 396,666, Jul. 9, 1982, abandoned. This application Nov. 30, 1984, Ser. No. 676,230

Claims priority, application Switzerland, Jul. 15, 1981, 4650/81

Int. Cl.[4] B23B *13/08, 15/00*

U.S. Cl. 82—2.7 **22 Claims**



1. A guide for precisely aligning and advancing bar stock for engagement with the head stock of an automatic lathe, said guide comprising:

an elongate inner member having a central longitudinal axis

and an outer surface including a plurality of longitudinal grooves extending parallel to said central axis,

a first elongate outer member having an inner surface positioned opposite to a portion of the outer surface of said inner member and including at least one first longitudinal groove extending parallel to said central axis,

a second elongate outer member having an inner surface positioned opposite to another portion of the outer surface of said inner member and including at least one second longitudinal groove extending parallel to said central axis,

said first and second outer members being positioned relative to said inner member such that said at least one first and said at least one second longitudinal grooves are each aligned with a different one of said plurality of longitudinal grooves in said inner member to define a plurality of straight passages each having a longitudinal axis parallel to said central axis and equidistant therefrom,

a guide tube disposed and retained within each of said straight passages defined by said outer and inner members, said inner surfaces of said first and second outer members cooperating with said outer surface of said inner member to support rigidly said guide tubes such that a longitudinal axis of each guide tube is coaxial with the longitudinal axis of a corresponding straight passage, said guide tubes each being straight, parallel and equidistant from said central axis,

support means for rigidly securing said inner and outer members with said guide tubes therebetween to form a drum having a longitudinal axis coaxial with said central axis, and

means for supporting said drum for allowing indexed rotation of said drum about said central axis to align coaxially the longitudinal axis of a guide tube with said head stock.

4,577,537
STAPLE FIBER CUTTING MACHINE

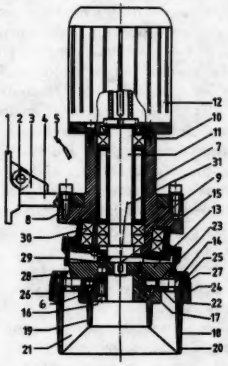
Ernst Bauch, Bordesholm, Fed. Rep. of Germany, assignor to Neumuenstersche Maschinen- und Apparatebau Gesellschaft mbH (NEUMAG), Neumuenster, Fed. Rep. of Germany

Continuation of Ser. No. 341,161, Jan. 19, 1982, abandoned. This application Sep. 17, 1984, Ser. No. 651,638

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1981, 3105877

Int. Cl.[4] D01G *1/04*

U.S. Cl. 83—343 **10 Claims**



1. A staple fiber cutting machine for continuously cutting cables of synthetic fibers, comprising a rotation-symmetrical rotary cutter supporting member having an outer surface and an axis and rotatable with a predetermined speed; a plurality of cutters provided with radially extending upwardly facing cutting edges, distributed over a periphery of said cutter supporting member, and having end portions extending outwardly beyond the latter; a first ring member having an inner diameter and being mounted on said end portions of said cutters and forming together with said outer surface of said cutter supporting member an annular passage, said first ring member having an outlet side; a pressing member extending at one portion of its periphery into said annular passage with a lateral play and to said cutting edges of said cutter, and forming at another portion of its periphery an inlet slot for a cable having an end, said pressing member being rotatable about an axis which is inclined to said axis of said cutter supporting member and with a speed substantially corresponding to said speed of the latter; a rotatable drum member having an inner diameter substantially corresponding to said inner diameter of said first ring member, and a length that could be anything but shorter than the distance between said cutting edges of two neighboring ones of said cutters, said outlet side of said first ring member being fixedly connected to said drum member so that said drum member laterally supports the end of the cable to be cut and so that the centrifugal force, created by said rotary cutter supporting member, that would tend to pull the cable end outwardly is compensated so as to assure that the cut cables are of uniform length; a hub having an end side and being oriented coaxially of said drum member; and a plurality of spokes extending between and connecting together said drum member and said hub so that said hub, said drum member and said spokes form a one piece element, said hub being further connected at its end side with said cutter supporting member.

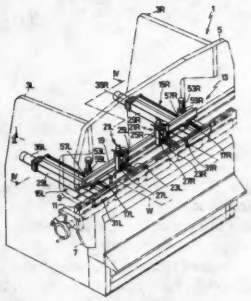
4,577,538
BACKGAUGE DEVICE

Tadashi Hirata, and Tadashi Amano, both of Isehara, Japan, assignors to Amada Company Limited, Japan

Filed Apr. 17, 1984, Ser. No. 601,287

Int. Cl.[4] B26D *7/02*; B23Q *3/00*

U.S. Cl. 83—467 R **12 Claims**



1. A backgauge device, comprising:

an upper frame member which supports an upper tool;

a lower frame member which supports a lower tool which carries out the processing of a workpiece in cooperation with the upper tool;

a plurality of guide members extending transversely from the back position of one of said upper frame and said lower frame, said guide members being installed such that they are separated from each other, each said guide member being provided with a movable body supported thereon which is movable in the direction of the guide members, and individually provided with a drive mechanism which drives individually the respective movable body;

a work stopper for a butting against the workpiece; and

a beam member extending transversely to the guide members for supporting the work stopper one end of the beam member horizontally pivotably supported on one of said movable bodies and the other end of the beam member

horizontally pivotably supported on and longitudinally slidable with respect to the other movable body;

wherein said movable bodies are capable of individual movement along their respective guide members such that the angle of the beam member with respect to the upper and lower tools may be adjusted.

4,577,539

APPARATUS FOR CUTTING SHEETS OF PLATE GLASS ACCORDING TO A PROGRAMMED PROFILE

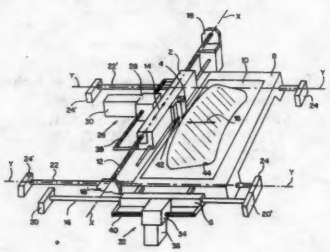
Carlo Bonacci, Leghorn, Italy, assignor to Societa Italiana Vetro SIV S.p.A., Vasto, Italy

Filed May 14, 1984, Ser. No. 609,688

Claims priority, application Italy, May 12, 1983, 48284 A/83

Int. Cl.[4] C03B *33/04*

U.S. Cl. 83—886 **6 Claims**



1. Apparatus for cutting sheets of plate glass according to a programmed profile, used particularly for automobile windows, comprising in combination:

a chassis;

a first piston rod fixed to said chassis, with a first hydraulic piston fixed to it;

a first cylinder in hydraulic and sliding engagement with said first rod and said first piston;

a first hydrodynamic control device fixed to the chassis, which hydrodynamically controls the sliding movement of said first cylinder;

a cutting head fixed to said first cylinder for cutting a sheet of plate glass;

at least two guide bars disposed perpendicular to said first piston rod and fixed to the chassis;

a table, sliding on said guide bars in a direction perpendicular to said first piston rod, for supporting on its surface the sheet of glass in a position enabling engagement with said cutting head for a cutting operation;

a second piston rod fixed to the chassis and parallel to said guide bars, having a second hydraulic piston fixed to it;

a second cylinder in sliding and hydraulic engagement with said rod and said second piston, and connected rigidly to said table; and

a second hydrodynamic control device which controls the sliding movement of said second cylinder, so that coordinated commands for the movements of said first and second cylinders, by means of said first and respectively second hydrodynamic control device, effect a cut of the glass according to the desired profile.

4,577,540

ELECTRONIC MUSICAL INSTRUMENT HAVING A PAN-POT FUNCTION

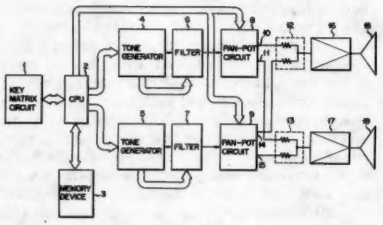
Kozi Yamana, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 530,028, Sep. 7, 1983. This application Apr. 22, 1985, Ser. No. 726,168

Claims priority, application Japan, Sep. 9, 1982, 57-157044

Int. Cl.[4] G10H *1/02*

U.S. Cl. 84—1.27 **4 Claims**



1. An electronic musical instrument having pan-pot means for generating musical sounds with pan-pot of the performed sounds in accordance with digital pan-pot data, the pan-pot means including:

control means including:

means for providing a plurality of preset pairs of first and second mutually complementary control signals, said control signal providing means including a reference voltage generator and first and second resistance type voltage division circuits for dividing a reference voltage generated from said reference voltage generator; and

switching means coupled to said control signal providing means and including first and second analog multiplexers for selectively outputting pairs of said first and second mutually complementary control signals in a given sequence in accordance with said digital pan-pot, said selected pairs of first and second control signals always having a mutually complementary relationship, said first and second analog multiplexers each having a plurality of control signal input terminals, said pairs of control signals respectively generated from said first and second resistance type voltage division circuits being coupled to said plurality of control signal input terminals of the first and second analog multiplexers while maintaining said complementary relationship between said control signals, and said first and second analog multiplexers each also having digital control input terminals for receiving said digital pan-pot data;

first sound volume variation means controlled as a function of said first control signal to vary the sound volume of a musical tone; and

second sound volume variation means controlled as a function of said second control signal to vary the sound volume of a musical tone;

said first and second sound volume variation means each including amplifier means having an amplification factor controlled by the respective control signals applied thereto, such that when said complementary control signals are applied at the same time to the respective amplifier means, the total musical sound produced and heard by a listener is substantially constant, irrespective of the pan-pot of the musical sound;

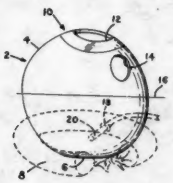
whereby a pan-pot of a sound performed in controlled in accordance with said first and second control signals by said pan-pot means.

4,577,541

MUSICAL DRUM

Neil R. Edge, 487 Joralemon, Belleville, N.J. 07109

Filed May 31, 1985, Ser. No. 739,738
Int. Cl.[4] G10D *13/02*
U.S. Cl. 84—411 R 7 Claims



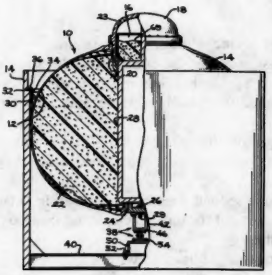
1. A musical drum comprising:
a generally spherical shell defining a resonant cavity;
said shell having a bottom and an upper end;
said shell being cut-out at said upper end thereof to define a first opening; and
said shell being cut-out, at a position between said first opening and a plane substantially mid-way between said bottom and said upper end, to define a second opening smaller than said first opening.

4,577,542

DOME RESTRAINT ASSEMBLY FOR ROCKET MOTORS

Peter F. O'Driscoll, Los Altos, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 7, 1984, Ser. No. 586,952
Int. Cl.[4] F42B *3/00*
U.S. Cl. 86—20 D 5 Claims



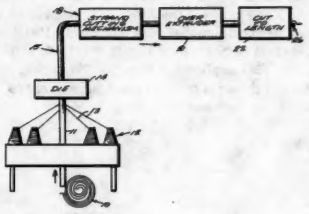
1. A support assembly for adjustably restraining the dome portion of a solid propellant rocket motor case during propellant loading and curing, comprising:
first attaching means for connection to said dome portion;
a substantially rigid base;
second attaching means connected to said rigid base and
a screw coupling connected between said first and second attaching means for selectively adjusting the spacing between said dome portion and base.

4,577,543

CONSTRUCTION OF A MONOLITHIC REINFORCED CATHETER WITH FLEXIBLE PORTIONS

Bruce C. Wilson, Glens Falls, N.Y., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Aug. 18, 1983, Ser. No. 524,347
Int. Cl.[4] D04C *1/06;* A61M *25/00*
U.S. Cl. 87—11 10 Claims



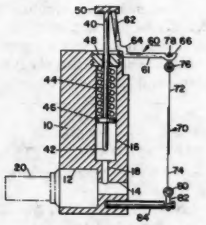
1. A method of constructing a selectively reinforced monolithic elongated generally cylindrical catheter, comprising the steps of:
(a) forming a relatively flexible elongated generally cylindrical body of relatively soft material by forming an inner core of thermoplastic material; and
(b) disposing reinforcing material in operative association with a part, but not all, of said body so that where the reinforcing material is disposed the body has significantly less flexibility, and where the reinforcing material is not disposed the body is relatively flexible, by: (i) passing said inner core through a reinforcement material wrapping apparatus; (ii) periodically interrupting wrapping action of the wrapping apparatus while continuing to pass the inner core therethrough so as to form relatively straight strand portions along the length of the outer surface of the inner core, and then restarting the wrapping action of the wrapping apparatus; and (iii) cutting off the relatively straight strand portions on the circumference of the inner core to provide the reinforcement-free, relatively flexible, portions of the monolithic catheter.

4,577,544

ULTRAFAST THERMAL ACTUATOR

John T. M. Lee, Phoenixville, Pa., assignor to ICI Americas Inc., Wilmington, Del.

Filed May 14, 1984, Ser. No. 609,632
Int. Cl.[4] F42C *19/00;* A62C *37/08, 35/02*
U.S. Cl. 89—1.14 3 Claims



1. An actuation system comprising:
(a) a percussion-initiated radially expandable actuator having a percussion-initiated explosive input charge, an explosive output charge and a casing, at least a portion of which expands radially outwardly when sid output charge is fired;

(b) a normally retracted percussion member which when released initiates said actuator; and

(c) a thermally responsive fusible link having a thin layer of fusible material for controlling the release of said percussion member.

4,577,545

PARALLEL RAIL ELECTROMAGNETIC LAUNCHER WITH MULTIPLE CURRENT PATH ARMATURE

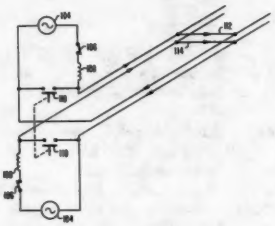
George A. Kemeny, Wilkins Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 381,603, May 24, 1982, Pat. No. 4,485,720. This application Sep. 13, 1984, Ser. No. 650,025

The portion of the term of this patent subsequent to Dec. 4, 2001, has been disclaimed.

Int. Cl.[4] F41F *1/02*

U.S. Cl. 89—8 **4 Claims**



1. An electromagnetic projectile launcher comprising:

four generally parallel conductors lining a bore;

a source of high current;

means for switching current from said high current source to said conductors;

means for conducting current between a first pair of said conductors and for propelling a projectile along said first pair of said conductors;

means for conducting current between a second pair of said conductors and for propelling said projectile along said second pair of said conductors;

said conductors extending along the entire acceleration distance of said projectile such that said means for conducting current between said first pair of conductors and said means for conducting current between said second pair of conductors each conduct current and propel said projectile over the entire projectile acceleration distance;

said means for conducting current between said first pair of said conductors including a first arc extending between said first pair of conductors;

said means for conducting current between said second pair of said conductors including a second arc extending between said second pair of conductors and being substantially parallel to said first arc; and

a gap between said first and second arcs wherein said first and second arcs are allowed to short as said projectile is propelled along said conductors.

4,577,546

GUN SIGHT RANGE EXTENDER

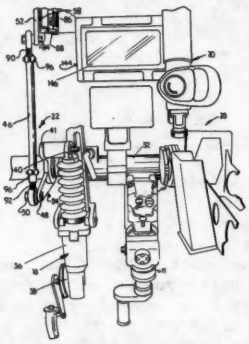
Theodore A. Jackson, Utica, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Nov. 21, 1983, Ser. No. 553,457

Int. Cl.[4] F41G *1/40*

U.S. Cl. 89—41.19 **2 Claims**

1. A gun sight system for a pair of guns mounted on a turret operator-controlled trunnion shaft comprising: gun sight means having means including an input shaft to adjust optics to select a target range; sight linkage means including a sight drive arm for coupling said input shaft for concurrent rotation with the trunnion shaft; first range indicator means fixed to said gun sight means and including range indicia thereon; a sight slide arm directly coupled to said input shaft for rotating it independently of said sight linkage means and including means positioned with respect to said first range indicator means to



indicate range adjustment of said optics; and second range indicator means fixedly secured to said trunnion shaft and movable therewith to indicate the amount of gun inclination independently of said first range indicator means.

4,577,547

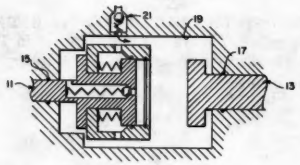
IMPACT TOOL

Bill L. Jaworski, 1257 S. Yank Ct., Lakewood, Colo. 80228

Continuation-in-part of Ser. No. 402,291, Jul. 27, 1982, abandoned. This application Sep. 6, 1983, Ser. No. 529,884

Int. Cl.[4] F15B *15/17*

U.S. Cl. 91—39 **20 Claims**



1. A method for accelerating a mass under the force of a compressed gas, said method comprising the steps of:

(a) providing a chamber having at least first and second outlets spaced from each other substantially along a common axis,

(b) mounting a first member in a sealing relationship in said first outlet for movement along said axis relative to said chamber,

(c) mounting a second member in a sealing relationship in said second outlet for movement along said axis relative to said chamber,

(d) pressurizing said chamber with a gas,

(e) moving at least one of said first and second members along said axis toward the other to a first position relative to the other of said first and second members,

(f) sealingly engaging portions of first and second members together within said chamber at said first relative position to define a first volume of gas therebetween,

(g) moving at least one of said first and second members toward the other along said axis to a second relative position to reduce the size of said first volume to a second, smaller volume,

(h) placing the gas between the portions of said first and

second members in fluid communication with the gas in said chamber,

(i) sealing the gas remaining between said portions from further fluid communication with the gas in said chamber,

(j) noving at least one of said first and second members away from the other to a third relative position to enlarge the volume of the gas remaining between said portions until the pressure of said remaining gas is less than the gas pressure of said chamber,

(k) moving both of said first and second members along said axis in a first direction while maintaining the lesser pressure of step (j),

(l) placing the gas remaining between the portions of said first and second members in fluid communication with the higher pressure gas in said chamber to accelerate at least one of said first and second members under the force of the higher pressure gas in said chamber along said axis in a direction opposite to said first direction and,

(m) repeating steps (e)–(l).

4,577,548

SERVOMOTOR FOR BRAKING ASSISTANCE

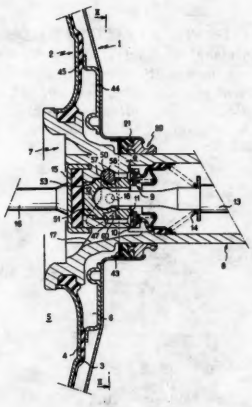
Jean P. Gautier, Aulnay Sous Bois, France, assignor to Societe Anonyme D.B.A., Paris, France

Filed Feb. 15, 1985, Ser. No. 701,895

Claims priority, application France, Feb. 22, 1984, 84 02656

Int. Cl.⁴ F15B *9/10*

U.S. Cl. 91—369 A **7 Claims**



1. A servomotor for braking assistance incorporating:

a casing,

a piston structure dividing the casing internally into two chambers,

distribution valve means situated in a valve body firmly fixed centrally to the piston structure and actuated by an input component to create selectively a differential pressure between the chambers, the valve means incorporating:

a plunger mounted so as to slide in the valve body, joined to the input component and defining at one of its ends a movable valve seat,

a valve body seat formed in the valve body, concentric with the movable valve seat,

valve means mounted in the valve body and elastically pushed towards the valve body seat and movable valve seat,

a return spring bearing against the valve body and pushing the input component in the direction opposite to that of the valve body seat and movable valve seat, and

a retaining component lying in the valve body and incorporating a first zone co-operating in contact engagement with a shoulder of the plunger and a second zone, outside the valve body, intended to co-operate in abutment with a stationary component firmly fixed to the casing in order to determine, in the configuration of the servomotor at rest, the rest position of the plunger,

characterized in that the retaining component is mounted in the valve body so as to pivot about an axis perpendicular to the direction of sliding of the plunger and incorporates a third zone intended, during hinging of the retaining component about the said axis, to co-operate in abutment with a corresponding surface of the plunger in order to determine for the latter a position of maximum retraction relative to the valve body under the effect of the return spring.

4,577,549

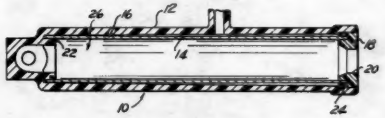
HYDRAULIC CYLINDER PROVIDED WITH LOW FRICTION PLATED INTERNAL SURFACE

Charles A. Frank, Farmington Hills, and David J. Compton, Troy, both of Mich., assignors to Automotive Products plc, Warwickshire, England

Filed Mar. 28, 1984, Ser. No. 594,325

Int. Cl.⁴ B21D *39/00*; B32B *15/08, 27/00*

U.S. Cl. 92—169 **20 Claims**



1. A hydraulic cylinder having an internal metallic surface provided with an adhering autocatalytically deposited nickel plating forming a matrix containing from 20 to 30% by volume of particles of a fluorocarbon resin of a particle size in the range of 0.1 micron to 1 micron, said plating being in the range of 2 to 25 microns in thickness, wherein said matrix contains 2 to 14% by weight of phosphorous.

4,577,550

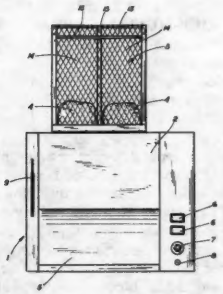
TOASTER

Steven Maroti, and Daniel Formosa, both of Ft. Lee, N.J., assignors to Hickory Industries, Inc., Long Island City, N.Y.

Filed Dec. 24, 1984, Ser. No. 686,011

Int. Cl.⁴ A47J *37/08*

U.S. Cl. 99—329 RT **4 Claims**



1. A toaster apparatus including:

a. at least two toaster elements defining a chamber in which a slice of bread is held to be toasted;

b. gravity means for feeding additional slices of bread to said chamber above said slice of bread being toasted;

c. a holding means adapted to be pivoted about an axis, said holding means being provided, on one side of said axis, with a portion to retain said bread in said chamber, between said toaster elements, during a toasting operation, and a portion on the opposite side of said axis to restrain a piece of bread above said bread held within said chamber from dropping, by gravity, through a slot into said toasting chamber;

d. pivot means for said holding means; and

e. means to rotate said holding means about said pivot means upon completion of a toasting operation to release said piece of bread being toasted and to restrain a piece of bread above that from dropping into said toasting chamber.

4,577,551

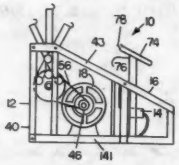
FETTUCCINE COOKING APPARATUS

Guido Bellanca, 220 E. 54th St., New York, N.Y. 10022

Filed Nov. 26, 1984, Ser. No. 674,767

Int. Cl.[4] A47J *37/12*; B01F *15/06*

U.S. Cl. 99—348 **9 Claims**



1. A cooking machine for preparation of fettuccine or the like, comprising in combination: a stove frame, a heat source mounted to said stove frame, a plurality of pan supports mounted to said stove frame, said pan supports each defining open-ended track means extending along an angle to the horizontal and adapted to receive and confine movement of a pan roller within said track means, a pan comprising a pan body, a handle secured to said pan body and a plurality of pan rollers each corresponding to one of said pan supports, each of said pan rollers of said pan being adapted to enter and move along said track means, said pan rollers being coaxial and adapted to allow said pan body to pivot on an axis through said rollers, and drive train means adapted to engage said handle of said pan and to move said handle of said pan in a closed vertical loop so as to reciprocate said pan along the length of said pan supports while pivoting said pan on the axis defined by said pan rollers.

4,577,552

RICE-HULLING APPARATUS

Soichi Yamamoto, 813-17 Oaza Tendou Kow, Tendou-Shi, Yamagata-Ken, Japan

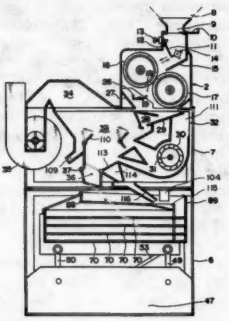
Filed Aug. 11, 1983, Ser. No. 522,029

Claims priority, application Japan, Jun. 17, 1983, 58-108889

Int. Cl.[4] B02B *3/04*

U.S. Cl. 99—524 **11 Claims**

1. A rice-hulling apparatus comprising a hulling section, an air-blow separating section disposed beneath and in communication with said hulling section for directing a blast of air into processed grain received from said hulling section thereby to separate hulls therefrom, a vibratory separating section disposed beneath and in communication with said air-blow separating section for separating the mixture of hulled and unhulled rice obtained from the air-blow separating section, an unhulled rice lifter disposed near one side of said sections and communicating directly with the upper end of said hulling section for supplying unhulled rice to said hulling section, a hulled rice lifter having an inlet communicating with said vibratory separating section for receiving and lifting the separated hulled rice discharged from said vibratory separating section, a pair of discharge gutters leading from an outlet of said hulled rice lifter to the hulling apparatus located at a next process station, and to said vibratory separating section, respectively, and a



change-over valve for switching said discharge gutters selectively into communication with the outlet of said hulled rice lifter.

4,577,553

APPARATUS FOR ATTACHMENT TO A BALER

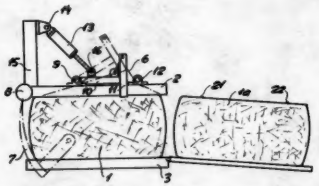
Jorn U. Weidemann, Rudkobing, Denmark, assignor to L. P. Weidemann & Sonner, Rudkobing, Denmark

Filed Mar. 22, 1984, Ser. No. 592,118

Claims priority, application Denmark, Mar. 22, 1983, 1292/83

Int. Cl.[4] B65B *13/28*

U.S. Cl. 100—4 **2 Claims**



1. For use with a baler for baling straw material with twine, having means for compressing bales of straw material under high pressure, and means for looping a plurality of twine bindings around each bale of compressed straw material by a corresponding plurality of twine knotters, each of which ties a knot for each twine binding;

apparatus for attachment to said baler for reducing twine tension in the twine bindings, comprising

(a) a gripper device (10) adapted to be rotatably journalled in said baler,

(b) a plurality of gripper means (11), one for each twine binding, secured to said gripper device (10),

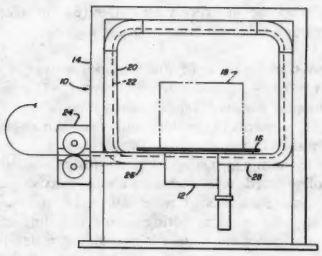
(c) hydraulic or pneumatic mechanism (13) for moving said gripper device (10) between a first position in which each gripper means (11) is disposed at a top face of a bale of compressed straw material where it can grip and retain a corresponding twine binding, and a second position in which each gripper means (11) is disposed at a predetermined distance from said top face of the bale which the twine knotters operate, and

(d) means (20) for releasing each twine winding from its corresponding gripper means (11) in said second position upon completion of the knotting operation.

4,577,554
KNOTTING APPARATUS FOR WIRE STRAPPING MACHINE

S. Bernard Brouse, Orland Park, Ill., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Mar. 22, 1985, Ser. No. 714,744
Int. Cl.[4] B30B *13/28*
U.S. Cl. 100—26 16 Claims



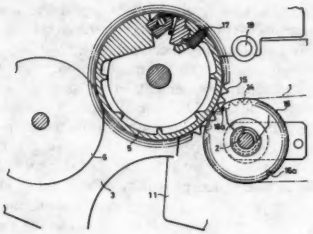
1. A knotter mechanism for a wire-tying machine comprising:
   a. a support housing having means defining a wire path therethrough;
   b. an axial shaft journaled in said housing;
   c. means to rotate said shaft in a first direction and in a reverse direction;
   d. first drive means releasably connected to said shaft so as to be rotatable with said shaft only when said shaft rotates in said first direction;
   e. a twister pinion journaled in said housing along said wire path and in operative engagement with said first drive means;
   f. second drive means releasably connected to said shaft so as to be rotatable with said shaft only when said shaft rotates in said reverse direction;
   g. a cutter bar pivotally attached to said housing and in operative engagement with said second drive means, said cutter bar being pivotable by being engaged by said second drive means when said second drive means is rotated by said shaft when said shaft is rotated in said reverse direction;
   h. third drive means releasably connected to said shaft so as to be rotatable with said shaft only when said shaft rotates in said reverse direction; and,
   i. wire ejector means slidably mounted in said housing and adjacent said twister pinion, said ejector means being reciprocable between a retracted position and an extended position by said third drive means when said third drive means is rotated by said shaft when said shaft is rotated in said reverse direction.

4,577,555
NUMBERING DEVICE FOR OFFSET PRESS

Koji Ishii, and Kenso Maehara, both of Hiroshima, Japan, assignors to Ryobi Ltd., Hiroshima, Japan

Filed Jan. 28, 1985, Ser. No. 695,325
Claims priority, application Japan, Jan. 30, 1984, 59-12583[U]; Jan. 30, 1984, 59-12584[U]; Jan. 30, 1984, 59-12585[U]
Int. Cl.[4] B41J *45/00*
U.S. Cl. 101—76 3 Claims

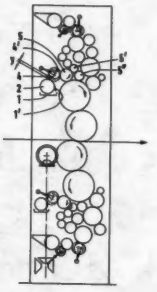
1. A slide mechanism for a numbering device for an offset printing press, wherein the numbering device is provided independently of a main machine of said offset press and is disposed rearwardly of a paper discharger of said main machine, said numbering device comprising: a pair of slide plates fixed to respective frames of said numbering device; first and second pairs of guide rollers provided on respective frames of said main machine, said rollers being positioned so as to receive said slide plates such that said numbering device is slidable towards and away from said main machine; a first gear mounted on a drive shaft of said main machine; a second gear mounted on a numbering impression cylinder of said numbering device, said first and second gears being relatively positioned so as to be brought into and out of engagement as said numbering device slides towards and away from said main machine; and detent means for selectively locking said frames of said main machine and said numbering device in a first position where said first and second gears are in mesh and a second position where said first and second gears are out of mesh.



4,577,556
DAMPING FLUID APPLICATION AND METERING APPARATUS FOR A PRINTING MACHINE

Hermann Fischer, Augsburg, Fed. Rep. of Germany, assignor to M.A.N. Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Nov. 30, 1984, Ser. No. 676,781
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1983, 3344777
The portion of the term of this patent subsequent to Mar. 25, 2003, has been disclaimed.
Int. Cl.[4] B41F *7/26, 7/36, 31/14*
U.S. Cl. 101—148 20 Claims



1. Damping fluid application and metering apparatus for an offset printing machine, particularly rotary offset printing machine, having
   a plate cylinder being driven at a predetermined circumferential machine speed;
   a damping fluid supply roller (2) carrying a film of damping fluid;
   a damping fluid-receiving foller (5);
   a damping fluid transfer roller structure having a plurality of rotatable axially spaced roller elements (4); and
   comprising,
   means (6) for rotatably supporting said spaced roller ele-

ments for selectively establishing a controlled continuous serial linear damping fluid transfer path from the damping fluid supply roller (2) to the receiving roller (5) or, selectively, interrupting said continuous transfer path,

wherein,

the receiving roller (5) is an axially reciprocating roller and is driven to operate at machine speed;

the support means (6) individually support the individual roller elements (4) in continuous surface engagement with the axially reciprocating receiving roller (5);

means for mounting said support means for individual movement of selected roller elements about an axis located on the opposite side of said roller elements from said fluid-receiving roller, said mounting means including means to maintain engagement of said fluid-receiving roller and said roller elements as said support means is moved about said axis for controlled proximity of said roller elements with the supply roller (2) and consequent transfer of damping fluid from the supply roller (2) to the receiving roller (5) as selectively controlled, in axially spaced zones, in accordance with individual selective engagement or disengagement of said roller elements (4) with the supply roller (2)

and individual stop means (12, 13, 17') are provided, coupled to the support means for adjustably controlling the extent of movement of the support means (6) and hence the degree of proximity of the respective roller element (4) with the damping fluid supplied roller.

4,577,557

INK APPLICATION AND METERING APPARATUS FOR A PRINTING MACHINE

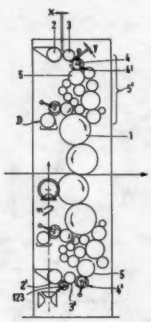
Hermann Fischer, Augsburg, Fed. Rep. of Germany, assignor to M.A.N. Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Nov. 30, 1984, Ser. No. 676,784

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1983, 3344778

Int. Cl.[4] B41F *7/02*

U.S. Cl. 101—217 **20 Claims**



1. Ink application and metering apparatus for a printing machine, particularly rotary offset printing machine, having

a plate cylinder (1) being driven at a predetermined circumferential machine speed;

an ink supply (2) carrying a film of ink of predetermined and controlled thickness, and driven at a speed which is slow with respect to machine speed;

an ink film transfer roller (3) driven at machine speed and having ink in film form applied thereto from the ink supply roller (2);

an ink roller train (5') transferring ink from the ink film transfer roller (3) to the plate cylinder of the printing machine, and operating at machine speed, said ink roller train including

an ink transfer roller structure (4') having a plurality of rotatable, axially spaced roller elements (4), said ink roller train (5') including an ink-receiving roller (5), engageable by said roller elements (4');

means (6) for movably supporting said spaced roller elements for selectively controllably establishing a continuous serial linear ink transfer path from the ink film transfer roller (3) to the ink receiving roller (5), or selectively, interrupting said continuous transfer path,

wherein,

the ink film transfer roller (3) and the ink-receiving roller (5) are driven to operate at machine speed;

and the support means (6) individually support the individual roller elements (4) in continuous surface engagement with the ink-receiving roller (5),

means for mounting said support means for individual movements of selected roller elements about an axis located on the opposite side of said roller elements from said ink-receiving roller, said mounting means including means to maintain engagement of said ink-receiving roller and said roller elements as said support means is moved about said axis for controlled individual selective movements through a movement path (y) toward and up to engagement with the ink film transfer roller (3) for relative application of ink from the ink film transfer roller to the ink-receiving roller, as selectively controlled in axially spaced zones in accordance with selective engagement or with controlled disengagement of said roller elements with the ink film transfer roller (3);

the ink supply roller (2) and the ink film transfer roller (3) are spaced from each other by an ink transfer gap (x) transferring ink, but permitting bridging of speed difference of the relatively slow speed of the ink supply roller and the machine speed of the ink film transfer roller (3);

and wherein the roller elements (4) of the transfer roller structure are driven by surface-frictional engagement with the ink-receiving roller (5).

4,577,558

INK METERING APPARATUS FOR A PRINTING MACHINE

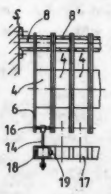
Hermann Fischer, Augsburg, Fed. Rep. of Germany, assignor to M.A.N. Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Nov. 30, 1984, Ser. No. 676,783

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1983, 3344776

Int. Cl.[4] B41F *31/26*

U.S. Cl. 101—365 **20 Claims**



1. Ink application and metering apparatus for a printing machine, particularly rotary offset printing machine, having

a plate cylinder (1) being driven at a predetermined circumferential machine speed;

a ductor roller (2) carrying a film of ink of predetermined and controlled thickness, and driven at a speed which is slow with respect to machine speed;

an ink receiving roller (5);

an ink transfer roller structure (4'), having a plurality of rotatable, axially spaced roller elements (4), and

comprising

means (6) for movably supporting said spaced roller elements (4) for selectively establishing a controlled continuous serial linear ink transfer path from the ink ductor roller (2) to the ink-receiving roller (5) or, selectively, interrupting said continuous transfer path via said spaced roller elements,

wherein,

the ink-receiving roller (5) is driven to operate at machine speed;

the support means (6) individually support the individual roller elements (4) in continuous surface engagement with the ink-receiving roller (5),

means for mounting said support means for individual movement of selected roller elements about an axis located on the opposite side of said roller elements from said ink-receiving roller, said mounting means including means to maintain engagement of said ink-receiving roller and said roller elements as said support means is moved about said axis for individual selective movement of said roller elements through a movement path (y) towards said ductor roller (2) through a limited extent up to a predetermined gap or nip (x) from the surface of the ductor roller in which the respective roller elements can receive ink from an ink film on the ductor roller in accordance with the width of said gap or nip;

and adjustable stop means (17; 12, 13, 22) are provided adjusting the width of the gap or nip between the respective individual roller elements (4) and the ductor roller (2) when moved towards the ductor roller by said support means.

4,577,559
ROTARY WEB PRINTING MACHINE

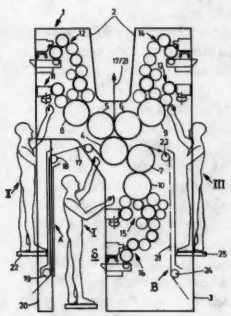
Rainer Burger, Augsburg, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Sep. 18, 1984, Ser. No. 651,676

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1983, 3335235

Int. Cl.[4] B41F 7/10

U.S. Cl. 101—221 8 Claims



1. Rotary newspaper web printing machine having

a pair of side walls (1);

a plurality of cylinders and rollers (4–15) positioned and retained between said side walls,

two of said cylinders (5, 6, 7; 4) forming, respectively, a printing cylinder and an impression cylinder for printing on a web (17, 21) being guided in an upward direction (A; B) for printing between said two cylinders,

at least one of said rollers forming an inker roller,

wherein

the side walls (1) comprise an upright structure substantially taller than the height of an operator in essentially amputated H shape having two upwardly extending arms (2) and only one downwardly extending single support leg (3), located essentially in vertical alignment with one and only one of said arms (2) and leaving a free space (S) adjacent the single downwardly extending support leg (3) and beneath the one of said upwardly extending arms which is not essentially in vertical alignment with said single support leg; and wherein said plurality of cylinders or rollers have their centers of rotation located in an asymmetrical Y configuration, the rollers located in one upper arm of said asymmetrical Y being mounted in one of said arms of said side walls, the rollers located in the other upper arm of said asymmetrical Y being mounted in the other of said arms of said side walls, and the rollers located in the downwardly extending leg of said asymmetrical Y being mounted in the downwardly extending leg of said side walls and comprising

a column or post structure (20), located at a far region of said free space, and positioned to support said one upwardly directed arm, which arm is out of alignment with, and remote from said single support leg (3), and the cylinders between the side walls of said one arm;

and guide roller means (18, 19) secured to and retained on said column or post structure (20) and located to guide the web in a rising path (A),

said free space (S) being of sufficient size to provide for access by an operator (I) between the column or post structure (20) and said single upright leg (3) of the side wall, and

an operator support platform (22) secured to the column or post structure (20).

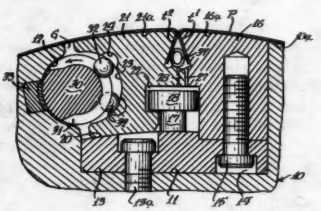
4,577,560
GAPLESS LOCK-UP FOR OFFSET PRINTING CYLINDERS

Ronald Banike, Orland Park, Ill., assignor to R. R. Donnelley & Sons Company, Chicago, Ill.

Filed Aug. 20, 1984, Ser. No. 642,080

Int. Cl.[4] B41F 27/12

U.S. Cl. 101—415.1 25 Claims



1. In a cylinder of a high speed rotary offset web printing machine, gapless lock-up means for an offset plate or a metal backed offset blanket with metal end tabs, said lock-up means comprising, in combination:

a slot in the cylinder surface extending substantially the entire length of the cylinder, said slot being provided with an outwardly facing arcuate surface that is concentric with the cylinder surface;

a fixed jaw and a movable jaw mounted in and occupying the full length of said slot and defining a recess, said jaws having extended arcuate outer surfaces flush with the surface of the cylinder and having facing undercut surfaces the outer margins of which intersect said arcuate outer surfaces along small radii of curvature so that an offset plate or blanket having metal end tabs wraps smoothly around the cylinder with said end tabs lying in uninterrupted facing contact with said outer margins and said undercut surfaces of said jaws, said movable jaw having a multiplicity of inclined recesses spaced generally evenly along a surface that is remote from the fixed jaw,

and said movable jaw being seated on said outwardly facing arcuate surface;

intermeshing flanges at the inner margins of said undercut surfaces, said flanges having top faces that cooperate to define the bottom of the recess;

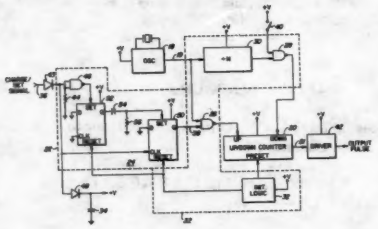
and rigid means for applying effectively uniform lateral force to the movable jaw throughout its length so as to impart translatory motion to said movable jaw across said outwardly facing arcuate surface between an open position and a closed position in which the end tabs at opposite ends of an offset plate or blanket are firmly and rigidly clamped against one another between the undercut jaws immediately adjacent the outer margins of said jaws, said rigid means comprising a rotatable screw with an arcuate groove that extends substantially the entire length of said movable jaw immediately adjacent said inclined recesses, and a ball in each recess engaged with the groove.

4,577,561

DIGITAL TIME FUZE METHOD AND APPARATUS

John W. Perry, Little Rock, Ark., assignor to BEI Electronics, Inc., Euless, Tex.

Filed Apr. 19, 1982, Ser. No. 369,749
Int. Cl.[4] F42C *11/06*
U.S. Cl. 102—215 **26 Claims**



1. A digital timing apparatus for providing an output signal at a selected and precise time interval following the occurrence of a start signal and in accordance with time interval data which is contained within a charge/set signal, the charge/set signal including a charging portion having a charge level and a setting portion which are separated by a single transition to a predetermined threshold level, wherein the time interval data is designated by a continuous interval of the charge/set signal throughout which the predetermined threshold level is attained, the apparatus comprising

oscillator means for providing a clock signal having a series of clock pulses;

control means responsive to the charge/set signal, the start signal and the clock signal, for providing an accumulate signal, the control means including means for detecting the duration of the continuous interval in the charge/set signal beginning at the single transition between the charge portion and the setting portion, and for inserting an interval of the clock signal into the accumulate signal which clock signal interval has a length determined by the duration of the continuous interval, and for providing a count-down signal which is initiated by the start signal and which has a frequency rate which is derived from the clock signal frequency; and

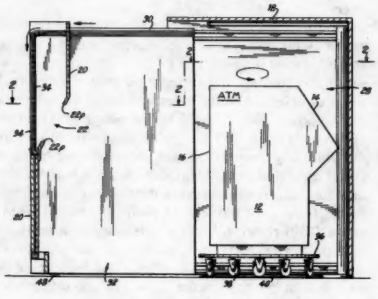
counter means responsive to the count-down signal and to the accumulate signal for counting the number of clock pulses in the accumulate signal to form a timer count, and for counting down from the timer count in accordance with the frequency rate of the count-down signal, the counter means providing the output signal when the count reaches a predetermined count state.

4,577,562

TELLER MACHINE ENCLOSURE

James Berman, 160 E. 93rd St., New York, N.Y. 10028

Filed Apr. 18, 1984, Ser. No. 601,649
The portion of the term of this patent subsequent to Apr. 30, 2002, has been disclaimed.
Int. Cl.[4] G07G *5/00*; E06B *7/32*
U.S. Cl. 109—24.1 **7 Claims**



1. A securely enclosed teller machine comprising:

a teller machine having an operable front panel and an openable service panel; and

a secure enclosure around said teller machine, said enclosure including;

a first side wall extending at least from a floor at a first side of the teller machine, up, over and down to the floor on the second side of the teller machine;

a front wall, said front wall being formed with a cut-out zone therein, said front wall movable between an inward position in which it is secured to said first side wall and an outward position in which it is disconnected from said first side wall, said front wall in said outward position being spaced from said first side wall, said cut-out zone having a perimeter sized and shaped to contact said teller machine when said front wall is in said inward position to expose said front panel;

said first side wall and said front wall in said inward position, defining a first enclosure space;

a second side wall connected to said front wall, and extending in from said front wall;

said second side wall, when said front wall is in said outward position, extending between said first side wall and said front wall to provide a second enclosure space outward of and in communication with said first enclosure space, and

a flexible shield movable between a retracted position and a protracted position, said shield when in said protracted position covering said cut-out zone and protecting said enclosure space when said front wall is in said outward position, said shield when in said retracted position uncovering said cut-out zone and permitting said cut-out zone to expose said operable front panel when said front wall is in said inward position.

4,577,563

SAFEKEEPING BOX ASSEMBLY

Karl J. Sidler, 420 Touzin Ave., Dorval, Quebec, Canada H9S 2N2

Filed Jul. 11, 1984, Ser. No. 629,902
Int. Cl.[4] E05G *1/04*
U.S. Cl. 109—52 **14 Claims**

1. An improved safety box assembly of the type comprising:

(a) a container defining an enclosure for the safekeeping of valuables, said container having a bottom wall and wall edges at one end defining an opening;

(b) a door hinged to the container for closing the opening;

(c) a mounting base having a bottom wall and means for allowing rigid fixation of said bottom wall onto a supporting surface; and

(d) means for removably securing the container onto the mounting base over the fastening means whereby to render said fastening means inaccessible when said container is so secured, said securing means comprising:

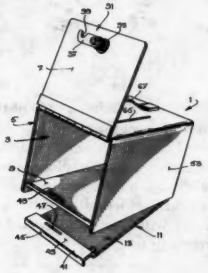
releasable interlocking means at the end of the container which is opposite to the opening for securing said opposite end to one end of the mounting base; and

locking means for simultaneously locking the door in the opening and securing the end of said container where is defined the opening to the other end of the mounting base, the improvement wherein said locking means comprises:

a lock mechanism mounted on and fixed to the door of the container;

hooking means movably by said lock mechanism; and

retaining means on the container and mounting base respectively, for simultaneously receiving said hooking means when the door is locked, whereby engagement of said hooking means in said retaining means when the door is closed and the lock mechanism operated, causes simultaneous attachment of the door, the container and the mounting base by said hooking means with the door locked in closed position and the container secured onto the mounting base,



wherein said improved assembly further comprises a bracket upstanding from the bottom wall of the base, said bracket including a horizontal wall extending parallel to the bottom wall of the base in spaced apart position with respect thereto for supporting the opened end of the container when said container has its other end interlocked with the mounting base, and

wherein said retaining means for receiving the hooking means consist of a pair of facing slots respectively provided for in the bottom wall of the container and the horizontal wall of the bracket in contact with said bottom wall of the container, said slots being positioned to receive the hooking means when the door is closed and the lock mechanism operated.

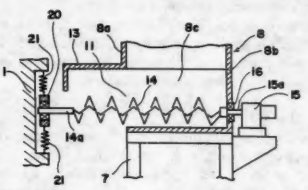
4,577,564

APPARATUS FOR FEEDING WASTE TIRE CHIPS

Yukio Tomita, Osaka; Kenjiro Nabeshima, Kobe, and Nobuji Shibamoto, Nara, all of Japan, assignors to Hitachi Zosen Corporation, Osaka, Japan

Filed Jan. 17, 1985, Ser. No. 692,388
Int. Cl.⁴ F23K *3/14, 3/16*
U.S. Cl. 110—110 **6 Claims**

1. An apparatus for feeding waste tire chips to an incinerator, the apparatus comprising a chip container having a front wall, a rear wall and an outlet at the lower end of the front wall, a screw feeder having a shaftless helical screw blade provided at an inner bottom portion of the container, the screw blade having one end supported by a first bearing provided on the rear wall of the container and the other end projecting from the outlet of the container, a rod of circular cross section attached to said other end, and a second bearing rotatably supporting the rod, the second bearing being disposed outside



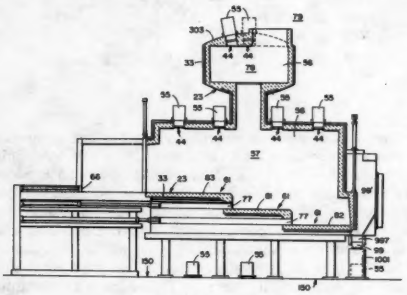
the container outlet and being supported by and connected between a pair of springs biasing the second bearing in opposite directions whereby the rod is displaceable radially and axially within a predetermined range and is tiltable within a predetermined range.

4,577,565

DETECTION OF RADIOACTIVE ACCUMULATIONS WITHIN AN INCINERATOR

Frederick C. Schoenig, Jr., Wilmington, N.C., and Leonard N. Grossman, Bratenahl, Ohio, assignors to General Electric Company, San Jose, Calif.

Continuation of Ser. No. 486,523, Apr. 19, 1983, abandoned.
This application Dec. 4, 1984, Ser. No. 677,374
Int. Cl.⁴ F23G *7/00*
U.S. Cl. 110—237 **9 Claims**



1. An incinerator for burning combustible material contaminated by radiation whereby radioactive ash is a combustion product, comprising a combustion chamber having containment walls of high density refractory brick provided with at least one window opening through said high density refractory brick containment walls comprising a low density body of ceramic fibers whereby any radiation from residual radioactive ash within the incinerator containment and inhibited by the high density refractory brick can penetrate outward through the window of low density fiber to beyond the incinerator containment walls, and a radiation detector mounted outside the incinerator containment walls adjacent to the said window of low density ceramic fiber for measuring any radiation passing out from the combustion chamber through the low density window whereby the amount of retained radioactive ash accumulted in the incinerator combustion chamber is indicated.

4,577,566

METHOD OF CONDITIONING FIRESIDE FOULING DEPOSITS USING LARGE PARTICLE SIZE AMORPHOUS SILICA

Gene A. Merrell, Huntingdon Valley, Pa., assignor to Betz Laboratories, Inc., Trevose, Pa.

Continuation of Ser. No. 364,378, Apr. 1, 1982, Pat. No. 4,458,606. This application May 11, 1984, Ser. No. 609,174

The portion of the term of this patent subsequent to Jul. 3, 2001, has been disclaimed.

Int. Cl.[4] F23B *7/00*

U.S. Cl. 110—343 **4 Claims**

1. Method of minimizing the deleterious effects of combustion residues emanating from coal burned as fuel in a boiler of the type having a furnace combustion zone in which said coal is burned and a convection zone located downstream from said combustion zone, said method comprising adding to said furnace an effective amount of amorphous silica particles at a location upstream from said convection zone, wherein at most about 10% of said particles, by volume, are greater than about 170 microns in diameter and wherein at least about 90%, by volume, of said particles are greater than about 38 microns in diameter.

4,577,567

METHOD OF COMBUSTION AND BURNERS

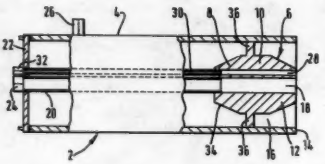
Colin Moore, Bradford, England, and David P. Jenkins, Neath, Wales, assignors to The BOC Group, plc, London, England

Filed Jun. 12, 1984, Ser. No. 619,865

Claims priority, application United Kingdom, Oct. 5, 1983, 8326685

Int. Cl.[4] F23D *1/00*

U.S. Cl. 110—347 **12 Claims**



1. A method of burning a particulate fuel which comprises atomising a composition which comprises 50 to 70% by weight of particulate fuel and 30 to 50% by weight of an aqueous carrier and which composition is able to be pumped without the presence in the composition of an emulsifying agent or lubricant to facilitate such pumping, supplying said composition to a combustion zone and supplying to the combustion zone substantially pure oxygen or oxygen-enriched air at substantially ambient temperature such that a flame temperature of at least about 2000° F. is established in said zone and combustion of the particulate fuel is supported.

4,577,568

BRACKET AND TOOTH ASSEMBLY FOR PLANTER

Miles Netsch, Rte. 2, Terril, Iowa 51364

Filed Oct. 25, 1984, Ser. No. 664,520

Int. Cl.[4] A01C *23/00*

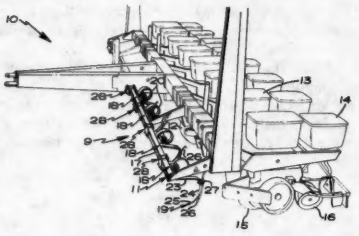
U.S. Cl. 111—7 **4 Claims**

1. A bracket and tooth assembly for a planter type implement having a horizontal tool bar, comprising:

a furrowing tooth including an upper arcuate portion terminating in a flat horizontal forwardly extending attachment tab, an intermediate portion integral with said arcuate portion and extending rearwardly and downwardly therefrom, a lower portion integral with said intermediate portion and extending forwardly and downwardly therefrom, a vertically disposed fertilizer tube for dispensing fertilizer therefrom into a furrow formed by the furrowing tool and being secured to the rear surface of the lower portion of the furrowing tool,

a bracket comprising a pair of substantially flat vertically disposed clamping plates engaging opposed surfaces of the horizontal tool bar of the planter implement, means engaging said clamping plates for releasably clamping the same against the tool bar,

an elongate arm rigidly affixed to one of said clamping plates extending outwardly therefrom in a direction substantially normal to the tool bar,



means connecting the attachment tab of the furrowing tooth to said arm comprising an elongate bar having one end thereof affixed to said arm and extending at substantially right angles thereto, said attachment tab being secured to said bar, whereby the position of the furrowing tooth is closely adjacent, but laterally of the seed furrow so that liquid fertilizer will be dispensed into the furrow formed by said furrowing tooth.

4,577,569

APPARATUS FOR HOLDING UNOPERATING NEEDLE BAR OF BRAIDING MACHINE

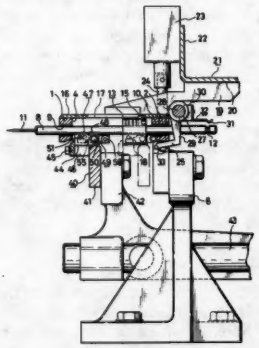
Yoshio Okugawa, Iruma, Japan, assignor to Hiraoka Kogyo Kabushiki Kaisha, Hanno, Japan

Filed Sep. 20, 1983, Ser. No. 533,942

Claims priority, application Japan, Sep. 20, 1982, 57-162165

Int. Cl.[4] D05C *3/04*; D05B *55/16*

U.S. Cl. 112—83 **1 Claim**



1. An apparatus for holding a plurality of needle bars of an embroidering machine, comprising:

support means upon which said needle bars are reciprocably mounted;

a moving block connected to each of said needle bars for advancement and retraction thereof and having stopper means extending therefrom at a right angle to a direction of movement of said moving block;

a driving band connected to said moving block and which includes a locating plate;

a plurality of L-shaped operating lever means corresponding to said needle bars, each of said levers including an inclined surface positioned at a front portion thereof and supported on said support means so as to be freely rotatable, said lever means including means for fixing said needles in an idle position;

a plurality of solenoids having operation bars attached thereto which are respectively rotated by said solenoids;

a plurality of engagement levers each of which includes a roller mounted at a rear end thereof for engagement with said inclined surface of said L-shaped operating lever means and a pressure member for engaging said stopper means; and

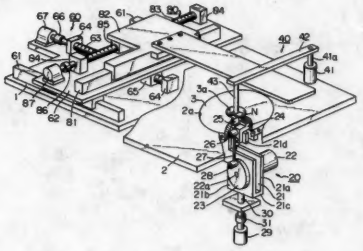
means for biasing said engagement means upwardly so as to connect said engagement means and said moving block upon advancement of said moving block.

4,577,570

AUTOMATIC APPARATUS FOR PICK-UP SEWING OF CURVED EDGES OF A FABRIC PIECE ON CLOTHING

Masatoshi Ichimura, Higashi-Osaka, Japan, assignor to Eagle Industry Company Limited, Osaka, Japan

Filed Sep. 5, 1984, Ser. No. 647,619
Claims priority, application Japan, Aug. 27, 1983, 58-179874
Int. Cl.[4] D05B *3/02, 21/00*
U.S. Cl. 112—121.12 **7 Claims**



1. Automatic apparatus for pick-up sewing of curved edges of a fabric piece on clothing comprising

a flat horizontal base plate,

a flat horizontal operation table coupled to said base plate and provided with a rotary disc having a center opening,

a sewing unit secured to the bottom face of said rotary disc, and provided with a sewing needle facing said center opening of said rotary disc, a needle drive motor for driving said sewing needle for said pick-up sewing and a first servo motor for driving said sewing needle for horizontal rotation about the center of said rotary disc,

a pressor unit arranged on said operation table, and provided with a pressor rod directed towards said center of said rotary disc and means for causing axial displacement of said pressor rod,

an X-directional shifter unit arranged on said base plate and provided with a second servo motor,

a Y-directional shifter unit arranged on said X-directional shifter unit and provided with a third servo motor,

a clothing controller carried by said Y-directional shifter unit and extending almost horizontally over said operation table in order to clamp said clothing therebetween, and

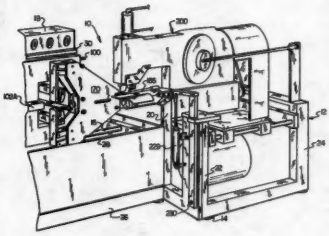
a center control circuit connected to said servo motors for supply of operation signals as programmed under computer control.

4,577,571

APPARATUS FOR FINISHING WAISTBAND END PORTIONS

Charles F. Carson, 2503 Lakeshore Dr., Greensboro, N.C. 27407

Filed Mar. 6, 1985, Ser. No. 708,650
Int. Cl.[4] D05B *23/00, 35/00*
U.S. Cl. 112—121.15 **10 Claims**



1. An improved automatically and sequentially operated apparatus for inverting a tubular portion of a garment waistband having fabric plies opposite each other with an open terminal free end portion and for stitching the plies of the open inverted free end together, said apparatus comprising:

(a) an inverting head assembly including a waistband impaling tongue means for supporting said waistband and said waistband open terminal end portion thereon, said inverting head assembly further comprising:

(i) automatically actuated means for initially releasably clamping and spreading the fabric plies of the waistband in spaced relation to the open terminal free end portion thereof;

(ii) automatically actuated means for thereafter inverting the open terminal free end portion of the waistband into the spread waistband thereby forming an inturned edge having a thickness of four plies and making a selected bulky area adjacent the juncture of the lower edge of the waistband adjacent said inturned edge;

(iii) automatically actuated flattening means for thereafter pressing said selected bulky area of the end portion of the waistband to reduce the thickness thereof in preparation for the ensuing stitching operation;

(b) a sewing head assembly comprising sewing instrumentalities positioned in transversely spaced relation to said inverting head assembly;

(c) said sewing head assembly and said inverting head assembly being so arranged with respect to each other that said waistband end portion is inverted and sewn while being maintained in substantially the same horizontal plane;

(d) shifting means for moving said inverting head assembly toward said sewing head assembly while maintaining said waistband end portion in said horizontal plane;

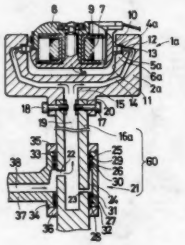
(e) gripping means associated with said sewing head assembly and in the path of movement of said inverter head assembly for receiving and gripping said waistband portion, said gripping means further including shifting means for positively moving the inturned edge of said waistband portion into proper alignment with said sewing head assembly for stitching the open free ends together.

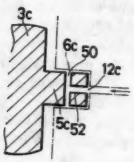
9. An automatically and sequentially operated apparatus for stitching the open inverted free end of a tubular portion of a garment waistband having fabric plies opposite each other with an open terminal free portion thereof which has been previously inverted, said apparatus comprising a sewing head assembly and a gripping means associated with said sewing head assembly for receiving and gripping said waistband portion, said gripping means further including transferring means for positively moving the inturned finished edge of said waistband portion into proper position for stitching the open inverted free ends together.

4,577,572
FULLY ROTATING HOOK FOR A LOCK STITCH SEWING MACHINE

Tokuzo Hirose, Osaka, Japan, assignor to Hirose Manufacturing Company Limited, Osaka, Japan

Filed Mar. 16, 1984, Ser. No. 591,194
Claims priority, application Japan, Sep. 6, 1983, 58-164876
Int. Cl.[4] D05B 57/08, 57/26, 71/02
U.S. Cl. 112—231 2 Claims





1. In a vertically oriented fully rotating hook assembly for a lock stitch sewing machine and being of the type including an inner bobbin case for supporting a thread bobbin, said bobbin case having formed on an outer peripheral surface thereof a track projection extending circumferentially of said bobbin case over a portion of the circumference thereof, an outer loop taker mounted about said bobbin case said loop taker having formed in an inner peripheral surface thereof a track groove extending circumferentially of said loop taker over a portion of the circumference thereof, means for rotating said loop taker about a vertical axis such that relative rotation occurs between said loop taker and said bobbin case, with such rotation being guided by said projection fitting within said groove, and means for reducing friction during such rotation between adjacent surfaces of said projection and groove, the improvement wherein said friction reducing means comprises:

means for injecting compressed air into a clearance between said adjacent surfaces and thereby for forming air films between upper, lower and radially outermost said surfaces of said projection and adjacent complementary said surfaces of said groove;

said injecting means comprising at least one air passage formed in said loop taker, a plurality of air holes opening into said groove and connected to said air passage, and means for supplying compressed air to said air passage and thereby injecting the compressed air through said air holes into said clearance;

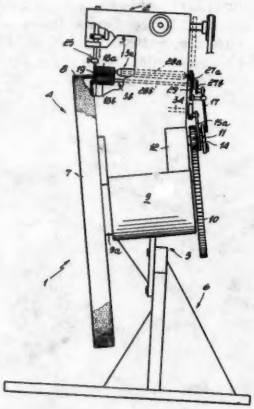
said supplying means comprising said rotating means being in the form of a hollow rotatable shaft fixed to the bottom of said loop taker, said shaft having therethrough a passage connected to said air passage in said loop taker, said shaft having therethrough a hole connected to said passage in said shaft, and means for introducing compressed air through said hole into said passage in said shaft; and

said introducing means comprising a pipe fixed in position surrounding a portion of said shaft having therein said hole, said shaft being rotatable within said pipe, means defining a sealed clearance between said shaft and said pipe, said sealed clearance being connected to said hole, and an air feed pipe connected to said pipe for supplying compressed air therethrough and into said sealed clearance.

4,577,573
PRECISION-STITCH SEWING MACHINE

Alessandro Peloggio, Brignano Gera D'Adda, Italy, assignor to Exacta S.p.A., Brignano Gera D'Adda, Italy

Filed Jan. 3, 1984, Ser. No. 567,837
Claims priority, application Italy, Jan. 10, 1983, 19044 A/83
Int. Cl.[4] D05B 27/10, 27/00
U.S. Cl. 112—318 6 Claims

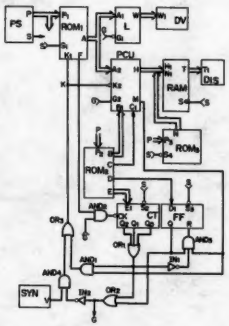


1. A precision stitch sewing machine for attaching hems to wearing apparel, comprising: a bearing frame; motor means carried on said frame; a sewing assembly carried on said frame and kinematically connected to and receiving its motion from said motor means; a feeding assembly for an article of clothing to be sewn carried on said frame substantially beneath said sewing assembly; a hem entrainment assembly carried on said frame adjacent to said feeding assembly, said hem entrainment assembly comprising a pair of entrainment rollers defining a passage for the hems therebetween; and drive means carried on said frame and interposed between said sewing assembly and said entrainment rollers, said drive means comprising rate changing means for changing the hem entraining rate relatively to the apparel feeding rate and control means arranged between said rate changing means and each of said rollers for moving said entrainment rollers in substantially equal and oppositely directed peripheral speeds, said rate changing means comprising an actuating lever kinematically connected to said sewing assembly for receiving its motion therefrom and to said feeding assembly for transferring its motion thereto, said rate changing means further comprising at least one rod adjustably interposed between said actuating lever and said control means for controlling the actuation rate of said control means.

4,577,574
ELECTRONIC SEWING MACHINE WITH A PATTERN DISPLAY

Yoshitaka Takahashi, Kanagawa, Japan, assignor to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed Mar. 26, 1984, Ser. No. 594,774
Claims priority, application Japan, Mar. 28, 1983, 58-50520
Int. Cl.[4] D05B *3/02, 35/12*
U.S. Cl. 112—445 7 Claims



1. An electronic sewing machine with a dot matrix display for representing the image of a selected pattern to be stitched, the selected pattern consisting of a plurality of cycles, the sewing machine comprising:

(a) pattern selecting means selectively operated to produce a pattern signal (P) and an activating pulse signal (S);

(b) first memory (ROM 1) for storing stitch control data and sequentially reading out said data per rotation of the sewing machine in dependence upon the selected pattern, said first memory being responsive to said activating pulse signal and said pattern signal to produce an initial stitch control data (A1) of said selected pattern;

(c) drive means which receives said stitch control data from said first memory means and drives the sewing machine according to said stitch control data;

(d) second memory means (ROM 2) for storing display condition data including data (E) defining a set number of cycles to be displayed of the selected pattern, said second memory means being responsive to said pattern signal (P) to produce said data (E) defining the set number of cycles;

(e) counting means being reset in response to said activating pulse signal (S) from said pattern selecting means to latch said data defining the set number of cycles and simultaneously produce a start signal (G);

(f) calculator means (CPU) being responsive to said start signal to latch said initial stitch control data of said selected pattern from said first memory means and simultaneously produce a data renewing signal (K);

said first memory means being responsive to said data renewing signal to produce the next stitch control data and simultaneously a cycle renewing signal (F), said counting means being responsive to said cycle renewing signal to start counting said number of cycles, said calculator means receiving said next stitch control data from said first memory means to make a calculation with said initial stitch control data and said next stitch control data to thereby produce a display data and simultaneously produce said data renewing signal, said operations

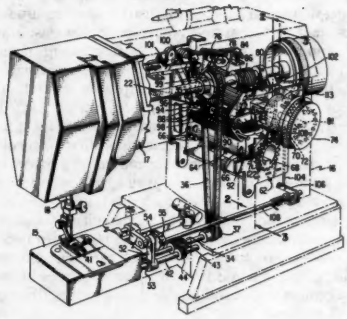
being continued in series until said set number of cycles is reached by the counting of said counting means while said calculator means is operated to repeatedly produce said display data of the selected pattern; and

(g) display means which receives said display data from said calculator means, temporarily stores said display data and displays it on the dot matrix display.

4,577,575
FOUR-STEP BUTTONHOLE MECHANISM FOR SEWING MACHINES

Victor G. Stevens, Westfield, and Pao-Ter Huang, Edison, both of N.J., assignors to The Singer Company, Stamford, Conn.

Filed Sep. 23, 1985, Ser. No. 778,654
Int. Cl.[4] D05B *3/06*
U.S. Cl. 112—449 4 Claims

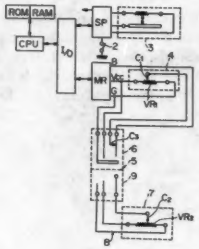


1. In a sewing machine having reversible work feeding mechanism, driven work feed pattern cam means, cam follower mechanism, operative connections between said cam follower mechanism and said work feeding mechanism including an operator influenced balance control for shifting the location of zero work feed within a range of cam follower mechanism movements, a four-step buttonhole mechanism including three work feed controlling cam means cooperable with said cam follower mechanism, a first of said buttonholing cam means for influencing zero work feed during bar tacking at each end of a buttonhole, the other two of said buttonholing cam means for influencing work feeding in opposite directions during stitching along opposite sides of a buttonhole, means securing said buttonholing cam means stationary on said sewing machine during buttonhole stitching, and operator influenced means for selectively varying the stationary position of said first of said buttonholing cam means so that it will influence zero work feed in any selected setting of said balance control.

4,577,576
STITCHING ADJUSTMENT DEVICE OF A SEWING MACHINE

Susumu Hanyu, and Kenji Kato, both of Tokyo, Japan, assignors to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed Aug. 23, 1984, Ser. No. 644,126
Claims priority, application Japan, Sep. 5, 1983, 58-136694[U]
Int. Cl.⁴ D05B *3/02*
U.S. Cl. 112—456 **2 Claims**



1. In a sewing machine comprising a stitch forming device; an electronic control device including a memory storing stitch control signals which may be selectively read out to control said stitch forming device to produce a selected pattern of stitches; means (3) for controlling a rotation speed of an electric motor for driving said sewing machine, said means being connected to said electronic control device and said motor by a speed control circuit; and means (4) for adjusting the amplitude of the stitches, said amplitude adjusting means being connected to said electronic control device by an amplitude adjusting circuit, the improvement comprising an external foot-operated controller for adjusting the amplitudes of the stitches, said foot-operated controller being positioned separately from said sewing machine; a first group of lead wires each having one end connected to said electronic control device through said amplitude adjusting circuit; a second group of lead wires each having one end connected to said foot-operated controller; and connector means including a first connector and a second connector, said first connector being provided on said sewing machine and holding an opposite end of each lead-wire of said first group, said second connector holding an opposite end of each lead wire of said second group, said second connector being detachably-connectable to said first connector so as to connect said foot-operated controller to said electronic control device through said amplitude adjusting circuit by said first and second groups of lead wires and disconnect said amplitude adjusting means from said electronic control device.

4,577,577
SLIDING DOOR ARRANGEMENT

Runar Eriksson, Turku, Finland, assignor to Oy Wärtsilä AB, Helsinki, Finland

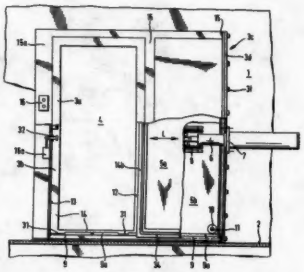
Filed May 16, 1984, Ser. No. 610,642
Claims priority, application Finland, May 27, 1983, 831912
Int. Cl.⁴ B63B *19/00*
U.S. Cl. 114—120 **20 Claims**

1. A sliding door arrangement for closing a passage opening in a generally vertical wall construction, said door arrangement comprising:

a frame unit attachable to said wall construction and bounding a door opening which corresponds to the passage opening when the frame unit is attached to the wall construction, said frame unit including two frame members arranged in spaced relationship and having respective sealing surfaces which surround the door opening in mutually confronting relationship;

a door unit mounted in the space between the frame members and including two door plates, said door unit being movable relative to the frame unit between an open position in which the door unit leaves the door opening essentially clear and a closed position in which the door unit blocks the door opening and the two door plates are in tight contact with the two sealing surfaces respectively about substantially the entire periphery of the door opening; and

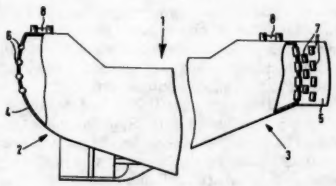
means for guiding the door unit to move relative to the frame unit in sliding manner without contacting the sealing surfaces during at least the major part of the movement of the door unit between the open position and the closed position, and for bringing about movement of at least one of the door plates away from the other door plate when the door unit has substantially completed its sliding movement from the open position towards the closed position, and for bringing about movement of said one door plate towards said other door plate before the door unit undergoes substantial sliding movement from the closed position towards the open position.



4,577,578
METHOD FOR TRANSPORTING GOODS BY FREIGHTER FROM AN ARCTIC PORT TO AN ICE-FREE PORT, AND FREIGHTER FOR THAT PURPOSE

Hans Meyer, Ratingen, Fed. Rep. of Germany, assignor to Ruhrgas LNG Flussigerdgas Service GmbH, Essen, Fed. Rep. of Germany

Filed Jan. 12, 1984, Ser. No. 570,232
Claims priority, application Fed. Rep. of Germany, Jan. 13, 1983, 3300894; Jan. 13, 1983, 3300898
Int. Cl.⁴ B63B *21/00*
U.S. Cl. 114—248 **12 Claims**



1. An ice-breaking freighter adapted to be coupled in tandem to at least one other ice-breaking freighter, said freighter comprising:

a stern of substantially spherical convex surface, and

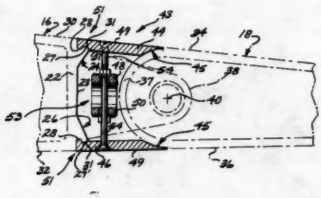
a bow having a substantially vertically disposed channel of convex vertical cross-section and concave horizontal cross-section, said stern and said bow shaped to cooperatively couple with the bow or stern, respectively, of a like

freighter to allow relative movement of coupled like freighters.

4,577,579
HYDROFOIL SEAL

John W. Williams, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 13, 1984, Ser. No. 650,251
Int. Cl.[4] B63B *1/24*
U.S. Cl. 114—274 **9 Claims**



1. Apparatus for sealing the surface spaces between the leading portion of a hydrofoil and its movable trailing flap, wherein the leading portion of the hydrofoil has upper and lower surfaces and a trailing edge, the hydrofoil flap also having an upper and lower surface and the trailing edge, the flap also having a leading edge spaced apart from the trailing edge of the leading portion of the hydrofoil, said apparatus comprising:

a. an upper seal member spanning the space between the upper surface of the leading portion of the hydrofoil and the upper surface of the flap;

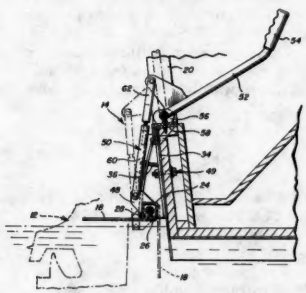
b. a lower seal member spanning the space between the lower surface of the leading portion of the hydrofoil and the lower surface of the flap; and,

c. seal retention means positioned between the upper seal member and the lower seal member and interconnected between those members for ensuring continuous contact between the upper seal member and the upper surfaces of the leading portion of the hydrofoil and the flap, and for ensuring continuous contact between the lower seal member and the lower surfaces of the leading portion of the hydrofoil and the flap.

4,577,580
TROLLING ATTACHMENT FOR BOATS

Robert J. Diffely, Sr., P.O. Box 79, Plaza, N. Dak. 58771

Filed Aug. 31, 1983, Ser. No. 528,050
Int. Cl.[4] B63B *1/16*
U.S. Cl. 114—285 **15 Claims**



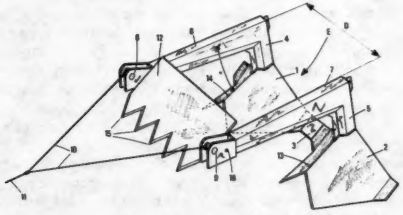
3. A trolling attachment for a motorboat comprising a trolling flap connected with a shaft, journal means for rotatably mounting the shaft on a transom of a boat so that rotation of the shaft enables the flap to be lowered into and raised from water in which the boat operates, a collar on the shaft having an outer surface with adjacent angularly displaced outer surface portions, an elongate leaf spring, and means for securing the leaf spring to the transom with one end of the spring bearing against the outer surface of said collar to provide frictional resistance to rotation of the shaft between positions in which the spring engages respective ones of said surface portions, the flap being in raised position out of the water when the spring is in engagement with one of said surface portions and being in lowered position in the water when the spring is in engagement with the other of said surface portions, and the spring positively engaging one or other of said surface portions to provide positive location and retention of the flap in one or other of said positions, means for varying the tension with which the spring engages the outer surface of said collar so as to adjust the force required to move the flap between the raised and lowered positions, the means for securing the leaf spring to the transom including a protruding bolt extending through an opening in the spring and a nut engaging the free end of the bolt, the nut providing said means for varying the tension of the spring.

13. A trolling attachment on a transom of a motorboat comprising shaft means, a pair of trolling flap assemblies on the shaft means each comprising a trolling flap connected to a rectangular section tube coaxially mounted on the shaft means, the trolling flap assemblies being spaced apart to accommodate the boat's motor therebetween, elongate brackets at respective ends of the shaft means rotatably attaching the shaft means to the transom and respective elongate leaf springs having upper ends attached to the transom above the shaft means and lower ends engaged over the outsides of the respective rectangular section tubes, the leaf springs resiliently engaging respective surface portions of the tubes for positively locating the flap assemblies in raised and lowered positions of the flaps determined by rotation of the shaft means.

4,577,581
ANCHORING DEVICE

Alain Puech, Rueil-Malmaison, France, assignor to Societe Nouvelle Construction Metalliques de Provence, Paris La Defense, France

PCT No. PCT/FR83/00002, § 371 Date Aug. 31, 1983, § 102(e) Date Aug. 31, 1983, PCT Pub. No. WO83/02432, PCT Pub. Date Jul. 21, 1983
PCT Filed Jan. 4, 1983, Ser. No. 536,159
Claims priority, application France, Jan. 5, 1982, 82 00043
Int. Cl.[4] B63B *21/34*
U.S. Cl. 114—294 **23 Claims**



1. An anchoring device for a floating installation to which the device is connected by an anchoring line, the device comprising:

an assembly of at least two plowshare anchors wherein each anchor includes an interior part of a shape facilitating penetration into ground and a posterior part, each anchor including a dihedron having an upper edge with a front portion;

at least two rigid shanks having an axis and first and second ends, each shank being connected at its first end to one of the dihedrons by a rigid strut extending upwardly from a location adjacent to both the upper edge and the posterior of the dihedron, the shanks being disposed in an orientation wherein the plane passing through the front portion of each upper edge of the dihedrons and the second end of the shanks define with the axis of each shank an angle in the range of about 15° to about 35°;

an anchoring plate rigidly fixed to the shanks and extending therebetween at a location adjacent to the second ends of the shanks; the anchoring plate having a pair of exposed, parallel surfaces which are substantially parallel to the upper edges of the dihedrons, and the anchoring plate having a leading edge defined by a plurality of teeth, and

means disposed at both ends of each shank for attaching anchor lines.

4,577,582

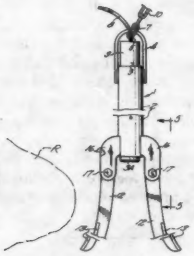
ANCHOR WITH PIVOTING ARMS

Roger L. Hedden, Box 33 Bl. Sky Hts., Clancy, Mont. 59634

Filed Aug. 27, 1984, Ser. No. 644,622

Int. Cl.[4] B63B *21/44*

U.S. Cl. 114—298 **3 Claims**



1. An anchor having positionable arm members enabling anchor stowage in a compact manner and also anchor release when fouled on an underwater obstruction, said anchor comprising,

a tubular shank structure including an upright tubular main body and an elongate arm control member slidably disposed in the tubular main body, a bail secured to the upper end of said main body and projecting thereabove, a limit stop limiting travel between said main body and said arm control member,

arm members having their proximal ends located adjacent one end of said tubular main body, pairs of flanges secured to and depending below said one end of the tubular main body with one each of said arm members swingably mounted between one of said pairs of flanges for travel through approximately 180 degrees whereby the arms may be placed in juxtaposition with the tubular main body of the shank structure for anchor stowage purposes and additionally in a trailed position offset below the tubular main body for anchor retrieval purposes,

said arm control member engageable with the proximal ends of the arm members to retain same in an operative position substantially perpendicular to the tubular shank structure,

an anchor line,

means securing the lowermost end of the anchor line to the upper end of said arm control member, and

a breakaway tie passing through said bail on the main body and normally securing the anchor line to said tubular main body for imparting raising or lowering forces to the anchor whereby upon rupture of the breakaway tie by anchor line exerted forces said anchor line will impart axial movement to said arm control member for disengagement of same with the arm member ends to permit a fouled arm member to swing out of contact with an underwater obstruction.

4,577,583

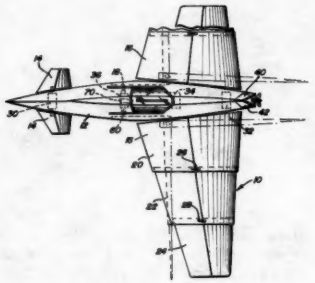
SMALL GLIDING UNDERWATER CRAFT

John G. Green, II, 9041 SW. 156th St., Apt. B-5, Miami, Fla. 33157

Filed Jun. 28, 1984, Ser. No. 625,799

Int. Cl.[4] B63G *8/00*

U.S. Cl. 114—332 **9 Claims**



1. A gliding underwater craft including an elongated streamlined hull having front and rear ends, a first pair of rear opposite side horizontally outwardly projecting foils having their centers of plan area disposed aft of amidships of said hull, a second pair of forward opposite side horizontally outwardly projecting foils considerably smaller in plan area than said first pair of foils and mounted from opposite side forward portions of said hull spaced considerably forward of amidships for controlled angular displacement relative to said hull about generally horizontal axes extending transversely of said hull, first control means for simultaneously angularly displacing said forward foils about said axes, said hull including front and rear buoyancy tank means, compressed gas storage tank means mounted within said hull centrally intermediate said buoyancy tank means, and second control means operatively associated with said storage and buoyancy tank means for selectively flooding and blowing said buoyancy tank means with ambient water and compressed gas from said storage tank, a rear lower portion of said hull defining a closed sided, horizontally rearwardly opening recess in which an electric motor driven rearwardly discharging marine propeller equipped propulsion assembly is mounted for adjustable angular displacement about an upstanding axis, third control means operatively connected between said hull and propulsion assembly for angularly displacing the latter relative to said hull, opposite side rear lower portions of said hull including water ingress passages formed therein opening outwardly of opposite sides of said hull and opening inwardly into the inner portion of said recess, said outwardly opening portions of said passages including lightly spring biased closed inwardly swingably openable closure doors.

4,577,584

BELL LOCK (II)

Nan C. Shih, 116, Changstao Rd., Changhua City, Taiwan (500)

Filed Dec. 24, 1984, Ser. No. 685,491

Int. Cl.[4] G08B *13/08*

U.S. Cl. 116—10 **2 Claims**

1. A lockable door knob able to ring, comprising:

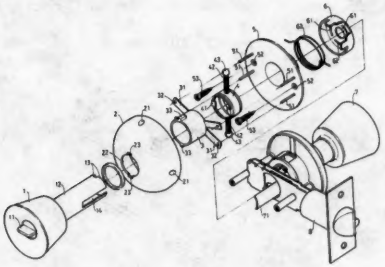
an inside knob constructed with a pipe shaft whose end is shaped as two protruding edges able to fix in two slots cut in a linking cover, said pipe shaft having elongate slots wherein a tip of a rotator can fit, a round-shaped bell with several pointed concavities,

said rotator containing springs whose ends are each provided with a steel ball,

a fixing frame fixed on hindrance rods of a fixing plate and able to restrict the position of said rotator between said fixing plate and the fixing frame,

the hindrance rods combining with said fixing frame to hinder the passing of said steel balls,

the linking cover combining with said protruding edges of said inside knob and with a key plate of an outside knob respectively,



the key plate combining with said linking cover to force a latch to move when either said inside knob or said outside knob is turned,

wherein manual rotation of said inside knob or said outside knob causes said rotator to rotate, and due to said hindrance rods said steel balls set on said rotator are temporarily hindered then forced to surpass said rods knocking against the concavities of said bell and making a sound of ringing by means of the springs set between said rotator and said balls.

4,577,585

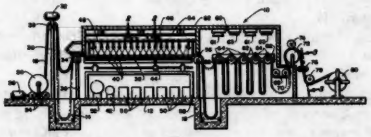
METHOD AND APPARATUS FOR MAKING A COLOR BLENDED WALL COVERING

Anthony G. Anselmo, 819 - 19th St., Santa Monica, Calif. 90403

Filed Apr. 23, 1984, Ser. No. 602,765

Int. Cl.[4] B05B *7/06, 3/00, 1/28;* **B05C** *5/00*

U.S. Cl. 118—50 **5 Claims**



1. A machine for applying a multiple colored pattern onto a ground or wall covering comprising:

a supply roll section for supplying a continuous strip of said ground, said ground having a width defined by a pair of spaced apart lateral parallel edges;

a paint spray chamber, said ground to be moved into and through said paint spray chamber along a lineal axis, a nozzle assembly mounted within said paint spray chamber, said nozzle assembly being adapted to spray paint, said nozzle assembly being movable in a direction transverse to said lineal axis so paint is applied to said ground across said ground, said movement of said nozzle assembly being continuous from one said lateral edge to the other said lateral edge, said nozzle assembly creating a smooth blend of colors on said ground with there being no visual break from one color to the next, said paint spray chamber including an elongated planar bed, said ground to be moved onto said bed and momentarily fixed in position by fixing means during which time painting of said ground is to occur;

a drying chamber, said ground being movable from said paint spray chamber into said drying chamber;

a collecting roll section for collecting the now painted and dried said ground;

first means for rotating of said supply roll section for continuously unwinding of said ground at a steady rate; and

second means for continuously rotating of said collecting roll section at a steady rate causing winding of said ground onto a collecting roll.

4,577,586

AUTOMATIC SKI WAXING MACHINE

Fredric H. Morris, and Alvan M. Morris, both of 7148 Loch Lomond Dr., Bethesda, Md. 20817

Filed May 2, 1985, Ser. No. 729,715

Int. Cl.[4] B05C *1/02, 11/02*

U.S. Cl. 118—63 **16 Claims**

1. An automatic ski waxing apparatus comprising conveyor means for transporting a person wearing skis along an elongated processing path, said conveyor means including guide means for locating said skis at predetermined positions relative to one another and relative to said conveyor means as said person is transported along said path, and a plurality of processing stations disposed along said path adjacent said positioned skis, said stations including first means for removing old wax from the under surface of said positioned skis, and second means downstream of said first means for applying new wax to the under surface of said positioned skis.

4,577,587

DEVELOPING APPARATUS

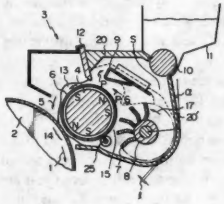
Yasushi Kamezaki, Sakai, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan

Filed Mar. 28, 1985, Ser. No. 717,012

Claims priority, application Japan, Mar. 30, 1984, 59-47155; May 16, 1984, 59-47528; May 16, 1984, 59-72527; May 16, 1984, 59-72529

Int. Cl.[4] G03G *15/09*

U.S. Cl. 118—658 **8 Claims**



1. A developing apparatus using a two-component type developer, which comprises a hopper provided with a toner feed roller, a developer delivery sleeve rotating in a direction reverse to the rotation direction of a photosensitive drum and having a magnet arranged in the interior thereof, a stirring roller for effecting frictional charging of toner particles and uniform mixing of a toner and a carrier, said stirring roller rotating in the same direction as the rotation direction of the developer delivery sleeve and being provided with a plurality of stirring vanes, an earing plate for controlling the earing

length of a magnetic brush formed on the developer delivery sleeve, and a developer flow guiding mechanism arranged above the stirring roller, wherein the top end of each stirring vane is bent in the rotation direction of the stirring roller and a notch is formed on each stirring vane, a spiral passage is formed on the stirring roller by the notches of the stirring vanes, and the developer flow guiding mechanism comprises a partition plate and a plurality of guide plates arranged at predetermined intervals at least on the upper face of the partition plate.

4,577,588

DEVICE FOR PROCESS-TYPE DEPOSITION OF POLYCRYSTALLINE SILICON ON CARBON FILM

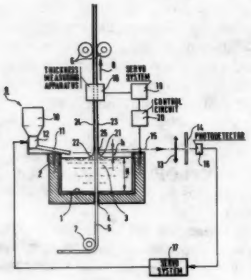
Michel Mautref, Ozoir la Ferriere, and Christian Belouet, Sceaux, both of France, assignors to Compagnie Generale d'Electricite and Societe Nationale Elf Aquitaine, both of, France

Filed Aug. 28, 1984, Ser. No. 644,910

Claims priority, application France, Aug. 29, 1983, 83 13834; Dec. 1, 1983, 83 19212

Int. Cl.[4] B05C *3/132*

U.S. Cl. 118—665 **7 Claims**



1. A device for process-type deposition of a coat of polycrystalline silicon or carbon film, said device comprising a crucible, an electrical system for feeding silicon to said crucible, crucible heating means enabling the formation of a silicon melt in said crucible, and means for upwardly transporting at a constant speed the carbon film passing vertically through the equilibrium surface of the melt in order to deposit said silicon coat, said device further comprising:

an optical system centered on an axis fixed in relation to said crucible, with said optical system fixed axis set to form a hot silicon radiation image of one specific target area of the silicon surface extending from just above to just below the interface line between the liquid silicon and the solid silicon deposited onto said carbon film,

a photodetector arranged to receive said image and operable to responsively deliver an electric measuring signal representative of the liquid level in said crucible,

and a servo system connected to the electrical output of said photodetector and operable to compare the measuring signal with reference signal representative of a preset level of the melt to yield an error signal, and said servo system being connected to the electrical drive for the crucible's silicon feed system so as to control crucible feed to reduce said error signal.

4,577,589

WIRE BASKET BIRD CAGE WHICH CAN BE ASSEMBLED FROM WIRE GRATING PARTS

Josef Voss, Haus Dreizehneichen, 5760 Arnsberg 1, and Gilles Thévenot, Schlossbergstrasse 2, 7570 Baden-Baden, both of Fed. Rep. of Germany

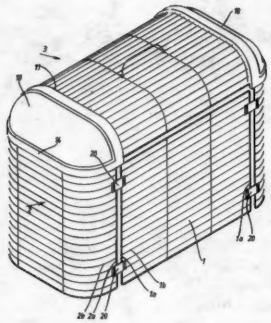
PCT No. PCT/EP83/00235, § 371 Date Nov. 9, 1984, § 102(e) Date Nov. 9, 1984, PCT Pub. No. WO84/03814, PCT Pub. Date Oct. 11, 1984

PCT Filed Sep. 6, 1983, Ser. No. 673,559

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1983, 3312474

Int. Cl.[4] A01K *31/00*

U.S. Cl. 119—17 **2 Claims**



1. A wire basket bird cage which can be assembled from wire grating parts, characterized by the following features:

it includes two equal wall grating parts lying opposite one another, two further equal wall grating parts lying opposite one another and joined to said first wall grating parts, and one roof grating part;

the wall grating parts are connected to one another by clip-like connecting parts;

at the connecting parts grooves are formed, which insertably accomodate the vertical wires of the wall grating parts, and abutments are formed for the horizontal wires, characterized by the following further features:

a solid shoulder part (**10**) is provided for the connection of the roof to each grating part (**2**) being attached to the flat walls (**1**);

each shoulder part has a curved edge (**11**) on the roof side with an inserting groove (**13**), which accomodates the curved roof;

each shoulder part has a side edge (**14**) with an inserting groove (**16**), which accomodates a curved grating part (**2**);

the respective wires of the wall grating parts and roof grafting parts are held in the respective grooves of the shoulder parts by elastic cross-pieces (**12,15**) with barbs (**12*a*, 15*a***).

4,577,590

WILD MOUSE CAT SCRATCH POLE

David D. Skroch, 2002 W. 13th, The Dalles, Oreg. 97058

Filed Oct. 17, 1984, Ser. No. 661,752

Int. Cl.[4] A01K *29/00*

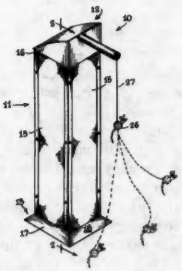
U.S. Cl. 119—29 **4 Claims**

1. An apparatus for providing entertainment and exercise for cats; wherein, the apparatus comprises:

a housing unit including a base plate, an elongated main frame member, and a hollow cap element disposed on top of said main frame member, and having an elongated hollow extension arm projecting outwardly therefrom; and

a mouse suspension and retraction unit including a weighted member connected by an elongated lanyard to a simulated

mouse member; wherein the weighted member is moveably disposed within the main frame member, and the simulated mouse member is disposed outside the main frame member; wherein the housing unit further comprises a plurality of fabric covered panel elements releasably associated with the main frame member; and, wherein the main frame member is further provided with a plurality of spaced apart outwardly extending projections which are adapted to releasably secure said plurality of panel elements intermediate said projections and said main frame member.

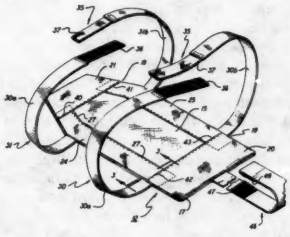


4,577,591

INCONTINENCE AND PROTECTIVE DEVICE FOR ANIMALS

Dianne M. Wesseldine, 313 Willard St., Minoa, N.Y. 13116

Filed Jan. 14, 1985, Ser. No. 691,204
Int. Cl.[4] A01K *23/00*
U.S. Cl. 119—143 **14 Claims**



1. An incontinence and protective device for use on the underside of a four legged animal that includes

a retainer means formed of a flexible cloth material that includes a bottom panel consisting of a rectangular front section and a tapered rear section for passing between the hind legs of the animal and a series of pocket-forming facing panels overlying the bottom panel that include a pair of side facing panels positioned along the side edges of the bottom panel, a front facing panel positioned over the front section of the bottom panel and a back facing panel positioned over the tapered section of the bottom panel,

seam means for stitching the facing panels to the bottom panel along its peripheral edge and to each other to form an open topped pocket in said retainer means,

a sanitary pad removably mounted within the pocket that includes a stiff semi-flexible frame adapted to pass under the facing panels and to retain the shape of the pad when inserted into said retainer means, but conform to the underside of the animal, and an absorptive core attached to the frame that is adapted to fill the pocket opening and thus contact the region on the animal to be protected,

a pair of two-piece straps that include a first strap having ends sewn into the seam means on opposite sides of the front section of the bottom panel immediately adjacent to the front edge thereof and a second strap having ends sewn into the seam means on opposite sides of the bottom panel immediately adjacent to the rear tapered section, and

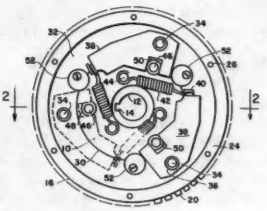
separable fastener means associated with each strap for permitting the straps to pass about the torso of the animal and be secured thereto to apply a gentle holding pressure against the pad mounted in the retainer means.

4,577,592

SELF ADJUSTING CAMSHAFT GEAR FOR INTERNAL COMBUSTION ENGINES

Henery G. K. Bosch, 240-B S. Pecos, Denver, Colo. 80223, and Thomas W. Pouliot, 2574 S. Yates, Denver, Colo. 80219

Filed Jun. 27, 1984, Ser. No. 625,242
Int. Cl.[4] F01L *1/34*
U.S. Cl. 123—90.15 **8 Claims**



1. A camshaft gear for an internal combustion engine, said gear comprising:

a hub member having an axial bore for receiving a camshaft and having a circular periphery coaxial with said camshaft bore;

a toroidal gear member coaxial with said hub member bore and having an inner surface in slideable contact with the periphery of said hub member, the periphery of said gear member being circular and having timing gear teeth thereon;

a plurality of at least three centrifugal weights coupled to a side face of said gear member for pivotal movement in a plane parallel with said side face, each of said plurality being slideably coupled to a first post extending from a corresponding side face of said hub member for rotating said hub member with respect to said gear member upon pivotal movement of said plurality of weights;

stop means including a plurality of discs, each disc adjustably connected by a screw through an off-center hole in said disc to said side face of said gear member and at a location overlying a portion of said hub member and adjacent the pivotal end of one of said weights for locking said hub against removal from said gear member and for adjusting the position of said weights when said camshaft is stationary; and

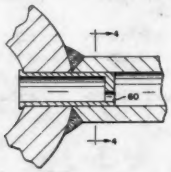
resilient means coupled between said hub member and each of said plurality of weights for preventing said pivotal movement of said plurality of weights below a predetermined rotational velocity of said camshaft.

4,577,593

WATERWALL TUBE ORIFICE MOUNTING ASSEMBLY

Bard C. Teigen, Enfield, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Nov. 8, 1984, Ser. No. 669,478
Int. Cl.[4] F22B *15/00, 25/00, 37/10*
U.S. Cl. 122—235 D 1 Claim



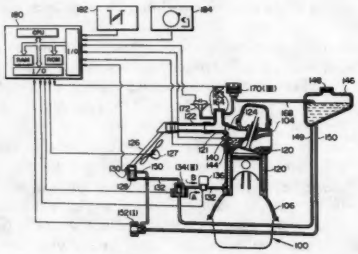
1. In combination, a steam generator having a furnace, tubes lining the walls of the furnace, each tube having a portion having a horizontal component near its inlet end, header means for supplying fluid to the tubes, pump means for forcing fluid through the header means into the tubes, restriction means positioned in the inlet of each tube in the portion having a horizontal component for insuring adequate flow of fluid to each of the tubes, each restriction means comprising an orifice in a plate located within each tube, each orifice being located at the very bottom of the plate adjacent to the bottom of each tube, so that when the steam generator is shutdown, each tube is completely self-drainable by means of gravity and substantially no fluid is trapped on the upstream side of the restriction means.

4,577,594

COOLING SYSTEM FOR AUTCMOTIVE ENGINE

Yoshimasa Hayashi, Kamakura; Takao Kubozuka, Yokosuka, and Yoshinori Hirano, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Feb. 22, 1985, Ser. No. 704,269
Claims priority, application Japan, Feb. 23, 1984, 59-32994; May 18, 1984, 59-100157; May 18, 1984, 59-100155
Int. Cl.[4] F01P *11/02, 3/22*
U.S. Cl. 123—41.08 13 Claims



1. A cooling system for an internal combustion engine comprising:

a coolant jacket formed about structure of said engine subject to high heat flux;

a radiator in which coolant vapor is condensed to its liquid form;

a vapor transfer conduit leading from said coolant jacket to said radiator;

means for returning liquid coolant from said radiator to said coolant jacket in a manner to maintain said structure subject to high heat flux immersed in liquid coolant and define a vapor collection space within said coolant jacket;

a reservoir containing liquid coolant;

valve and conduit means for selectively establishing fluid communication between said coolant jacket and said reservoir;

valve and conduit control means including circuitry for:

(a) conditioning said valve and conduit means so as to establish fluid communication between said reservoir and a cooling circuit which includes said coolant jacket, said radiator and said second vapor transfer conduit, when the temperature of the coolant within said coolant jacket is below a first predetermined level and the pressure prevailing within said cooling circuit is below ambient atmospheric pressure by a second predetermined amount;

(b) conditioning said valve and conduit means so as to introduce excess coolant from said reservoir into said cooling circuit when the engine is started and the temperature of the coolant in said coolant jacket is below a third predetermined level and thus purge out any non-condensible matter in said cooling circuit;

(c) conditioning said valve and conduit means so as to permit coolant to be displaced from said engine under the influence of the vapor pressure produced within said cooling circuit when the engine is running and the temperature of said coolant is above said third predetermined level, and for terminating the displacement when said the amount of coolant contained in said cooling circuit has been reduced to a predetermined desired level; and

(d) monitoring the operation of said liquid coolant returning means to determine if the correct amount of coolant has been retained in said cooling circuit and for conditioning said valve and conduit means to permit correction of the amount of coolant to said desired level.

6. A method of cooling an internal combustion engine comprising the steps of:

introducing liquid coolant into a coolant jacket formed about structure of said engine subject to high heat flux in a manner to immerse said structure in a predetermined depth of liquid coolant;

allowing the liquid coolant in said coolant jacket to boil;

condensing the vapor produced by the boiling in said coolant jacket to its liquid form in a radiator;

transferring the coolant vapor from said coolant jacket to said radiator using a vapor transfer conduit;

returning liquid coolant from said radiator to said first coolant jacket using a coolant return arrangement in a manner to maintain said structure subject to high heat flux immersed in said predetermined depth of liquid coolant and define a vapor collection space within said coolant jacket;

storing additional coolant in a reservoir;

conditioning said valve and conduit means so as to establish fluid communication between said reservoir and a cooling circuit which includes said coolant jacket, said radiator and said second vapor transfer conduit, when the temperature of the coolant within said coolant jacket is below a first predetermined level and the pressure prevailing within said cooling circuit is below ambient atmospheric pressure by a second predetermined amount;

conditioning said valve and conduit means so as to introduce excess coolant from said reservoir into said cooling circuit when said engine is started and the temperature of the coolant in said coolant jacket is below a third predetermined level and thus purge out any non-condensible matter in said cooling circuit;

conditioning said valve and conduit means so as to permit coolant to be displaced from said engine under the influence of the vapor pressure produced within said cooling circuit when the engine is running and the temperature of said coolant is above said third predetermined level, and for terminating the displacement when the amount of coolant contained in said cooling circuit has been reduced to a predetermined desired level;

monitoring the operation of said liquid coolant returning

arrangement to determine if the correct amount of coolant has been retained in said cooling circuit; and

correcting the amount of coolant retained in said cooling circuit in the event that said step of monitoring reveals that the amount of coolant retained in said cooling circuit is not at a desired level.

4,577,595

PISTON FOR A RECIPROCATING PISTON INTERNAL COMBUSTION ENGINE

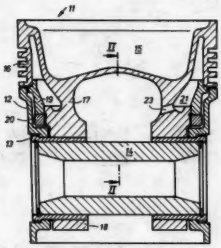
Herbert Deutschmann, and Karl Schier, both of Friedrichshafen, Fed. Rep. of Germany, assignors to MTU Motoren-und Turbinen-Union Friedrichshafen, GmbH, Friedrichshafen, Fed. Rep. of Germany

Filed Jul. 19, 1984, Ser. No. 632,323

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1983, 3338419

Int. Cl.⁴ F01P *3/10*; F16J *1/00*

U.S. Cl. 123—41.35 **5 Claims**



1. A piston for a reciprocating piston internal combustion engine, comprising a piston top, a piston skirt and wrist pin means for interconnecting the piston top and piston skirt, the piston top including a combustion space recess, a piston ring carrier means surrounding the combustion space recess and a ring-shaped extension disposed at the bottom of the combustion space recess having two support bearing means and supporting the piston top at the wrist pin means, and means for connecting the piston ring carrier means with the ring-shaped extension including a ring-shaped support element, said ring-shaped support element being clamped between the piston ring carrier means and ring-shaped extension by a nut means cooperating with the ring-shaped extension.

4,577,596

INTAKE MANIFOLD STRUCTURE FOR A V-TYPE INTERNAL COMBUSTION ENGINE

Akihisa Senga, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

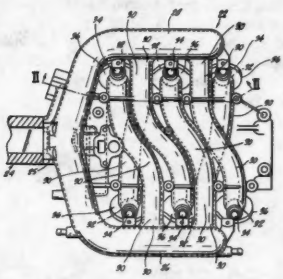
Filed Dec. 21, 1983, Ser. No. 563,942

Claims priority, application Japan, Dec. 22, 1982, 57-228866

Int. Cl.⁴ F02B *75/22*

U.S. Cl. 123—52 MV **8 Claims**

1. An intake manifold for a V-type internal combustion engine with two cylinder banks and a plurality of cylinder inlet ports, comprising, an air inlet opening, two supply tubes connected to said inlet opening, said supply tubes arranged substantially in the shape of a "U", each said supply tube being mounted substantially above and parallel to one cylinder bank, a plurality of branch tubes formed longitudinally along each said supply tube and extending across the engine with an open end extending substantially perpendicular to said supply tubes, said branch tubes being arranged such that at least two of said branch tubes extending from the same supply tube are vertically aligned one on top of the other at the supply tube along a plane normal to said supply tube and for a portion of their lengths extending from that supply tube, and means to connect each said branch tube open end to a cylinder inlet port on an



opposite side of the engine from the supply tube to which that branch tube is connected.

4,577,597

METHOD AND APPARATUS FOR SUPPLYING FUEL TO INTERNAL COMBUSTION ENGINE

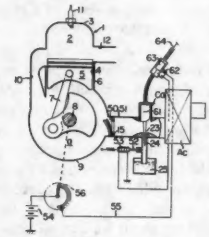
Takao Tomita, Niiza, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 11, 1982, Ser. No. 387,553

Claims priority, application Japan, Jun. 18, 1981, 56-94457; Jun. 22, 1981, 56-96329

Int. Cl.⁴ F02B *33/00*; F02D *1/00*

U.S. Cl. 123—73 A **15 Claims**



1. An apparatus for supplying fuel to a two-cycle internal combustion engine having a rotating crankshaft in a crank chamber, comprising an intake port provided in said engine and open to said crank chamber of the engine, a single intake passage connected at one end to said intake port and at an opposite end leading to atmosphere, and means connected to an intermediate portion of said intake passage for supplying fuel to the latter and suspending fuel supply thereto, wherein said means comprises:

a carburetor disposed in the intermediate portion of said intake passage, said carburetor having a venturi portion, a float chamber and a fuel injection nozzle connecting between said venturi portion and said float chamber;

a stop valve for controlling injection of fuel into said intake passage through said fuel injection nozzle;

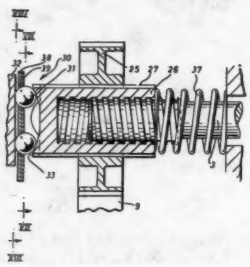
a valve actuator operatively connected to said stop valve; and

a switch means disposed in a circuit connecting said stop valve and said value actuator, said switch means being operatively connected to said crankshaft of said engine to actuate said stop valve in accordance with revolution speed of said engine, such that said means acts to alternately admit air-fuel mixture and fresh air only, respectively, during alternate revolutions of said engine.

4,577,598
INTERNAL COMBUSTION ENGINE AND CAM DRIVE MECHANISM THEREFOR

Thomas T. Ma, Chelmsford, United Kingdom, assignor to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 386,851, Apr. 9, 1982, abandoned. This application Jan. 30, 1985, Ser. No. 696,674
Int. Cl.[4] F01L *1/34*
U.S. Cl. 123—90.18 4 Claims



1. A cam drive mechanism for driving the camshaft of a four-stroke internal combustion engine having one or more sets of n number of cylinders where n is a positive integer, a piston connected to a crankshaft and reciprocable in each cylinder and being either in phase or out of phase with any other piston in the set to which it belongs by a phase angle A°, or an integral multiple thereof, and a camshaft carrying a plurality of rotatable cams for actuating inlet and/or exhaust valves for each cylinder in the set, characterized in the cam drive mechanism comprising means for rotating the camshaft with a rotational movement which is a combination of a circular motion about its axis of rotation which has a predetermined phase relationship with the circular movement of the crankshaft and an oscillatory motion about its axis of rotation to advance and retard the angular position of the cams relative to the valves with which they are associated, the oscillatory motion having a predetermined phase relationship with the crankshaft, and means for varying the amplitude of the oscillatory motion whereby the timing of the opening and closing of the valves may be varied, characterized in that the speed of the circular movement of the camshaft is half the speed of the crankshaft and the frequency of oscillations of the camshaft is f times the frequency of rotation of the crankshaft, wherein:

f=2n when the number of engine cylinders n=1;

f=n or n/2 when n=2;

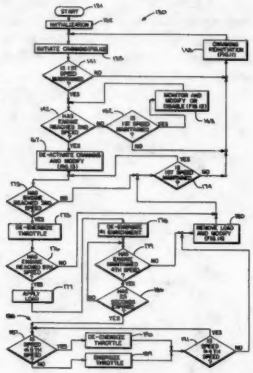
f=n when n/2=3 or more;

the cam drive mechanism means comprising a rotatable drive member drivable by the crankshaft, and a connection between the drive member and camshaft for transmitting the rotary motion of the drive member thereto, said connection including a sleeve element rotatable by said drive element and axially slidable relative thereto and having a helically splined connection with the camshaft whereby axial movement of the sleeve element effects a rotation of the camshaft relative to the drive member, and means effecting a continuous reciprocation of the sleeve element first in one axial direction and then in the return opposite direction, to provide a continuous oscillatory movement of the camshaft relative to the drive member and crankshaft.

4,577,599
REMOTE STARTER FOR INTERNAL COMBUSTION ENGINE

Cary J. Chmielewski, N. Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Sep. 27, 1982, Ser. No. 423,816
Int. Cl.[4] F02N *11/08*
U.S. Cl. 123—179 B 11 Claims
MICROFICHE APPENDIX INCLUDED
(1 Microfiche, 19 Pages)



1. A control to remotely start an internal combustion engine, comprising

a remote start command remotely located with respect to said engine and operable to provide a start command signal,

a local start command electrically connected to said remote command to provide a start initiation signal in response to said start command signal,

means electrically connected to said local start command and to said engine to initiate a starting sequence for said engine in response to said remote start command signal,

sensing means connected to sense a plurality of operating conditions of said engine during cranking,

modifying means operatively connected to said sensing means to selectively modify at least one of a plurality of operating sequences for said engine in response to the failure of said engine to reach one of a plurality of predetermined operating conditions to optimize the starting performance of said engine, and

cranking reinitiation means operatively connected to said sensing means to de-activate said starting sequence and initiate another starting sequence in response to the failure of said engine to reach one of said plurality of predetermined operating conditions.

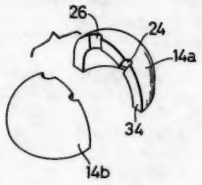
4,577,600
STRUCTURE OF DIVIDED COMBUSTION CHAMBER FOR DIESEL ENGINE

Tetuya Morita; Akinori Wakasa, both of Hiroshima; Yutaka Ogawa, and Takayuki Ogasawara, both of Nagoya, all of Japan, assignors to Mazda Motor Corporation and NGK Insulators, Ltd., both of, Japan

Filed Oct. 9, 1984, Ser. No. 658,884
Claims priority, application Japan, Oct. 6, 1983, 58-155875[U]; Oct. 6, 1983, 58-155876[U]
Int. Cl.[4] F02B *3/00*
U.S. Cl. 123—270 25 Claims

1. A structure defining a divided combustion chamber of a Diesel engine, comprising: an upper ceramic member having a substantially hemispherical head and a lower ceramic member having an injection port, said lower ceramic member meeting

with the upper ceramic member at an interface to form the divided combustion chamber therein, said upper ceramic member including at least one through hole extending from an outer surface thereof to an inside surface of said divided combustion



chamber and at least one structural feature selected from the group consisting of a cut and a slit formed in a straight plane on at least said outer surface and extending from said at least one through hole to another at least one through hole or to said interface.

4,577,601

GLOW PLUG ARRANGEMENT

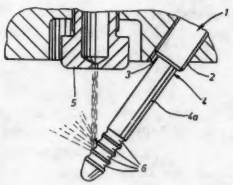
Roland Klak, Ost fildern, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 18, 1984, Ser. No. 571,824

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1983, 3301559

Int. Cl.⁴ F02B *3/00*

U.S. Cl. 123—298 **5 Claims**



1. Glow plug arrangement for a compressed air charged combustion engine for motor vehicles and the like, comprising:

a glow plug housing; and

a heating rod extending outwardly of the housing into an engine combustion space in a region intersecting with a fuel stream supplied from an injection nozzle;

wherein the heating rod is disposed at a sharp angle to the injected fuel stream and is provided in the region impinged on by the fuel stream with an irregular surface to improve the atomization and ignition of the fuel, said irregular surface being formed as a plurality of ring grooves around the circumference of the heating rod, and wherein said ring grooves include sharp edged outer surface portions.

4,577,602

HIGH SWIRL VERY LOW POLLUTION PISTON ENGINE EMPLOYING OPTIMIZABLE VORTICITY METERING

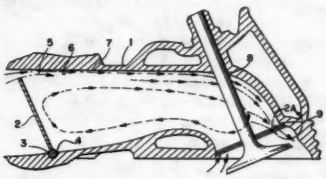
Merle R. Showalter, Madison, Wis., assignor to Automotive Engine Associates, Madison, Wis.

Continuation of Ser. No. 328,850, Dec. 9, 1981, abandoned, which is a division of Ser. No. 47,472, Jun. 11, 1979, Pat. No. 4,344,394, which is a continuation-in-part of Ser. No. 914,857, Jun. 12, 1978, abandoned, which is a continuation of Ser. No. 791,422, Apr. 27, 1977, abandoned, which is a continuation of Ser. No. 547,040, Feb. 4, 1975, abandoned. This application Mar. 19, 1984, Ser. No. 589,869

The portion of the term of this patent subsequent to Aug. 17, 1999, has been disclaimed.

Int. Cl.⁴ F02B *31/00*

U.S. Cl. 123—306 **3 Claims**



1. In a multicylinder four stroke engine having an exhaust passage and a common intake manifold passage volume for several cylinders with depending intake ports wherein said intake manifold passage volume is maintained below atmospheric pressure during low power operation of said engine wherein said engine has in each intake port a variable restriction adapted to close off at least 70% of each port's flow cross section wherein for each such port the restriction is configured so that flow past it will form a wall attached stream and a step-up protrusion intake manifold passage wall to break up any wall attached backflowing stream of exhaust backflow past said restriction so that said exhaust backflow does not penetrate deeply enough into said manifold passage to disrupt the even delivery of air, exhaust gases, and fuel to the individual cylinders of said engine.

4,577,603

DEVICE FOR CONTROLLING ENGINE RPM

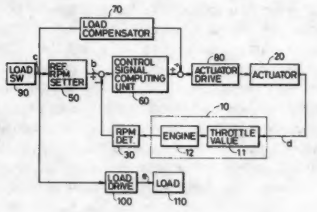
Masanobu Murakami, and Masaaki Miyazaki, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 524,254, Aug. 18, 1983. This application Feb. 22, 1985, Ser. No. 704,689

Claims priority, application Japan, Aug. 18, 1982, 57-144419; Aug. 18, 1982, 57-144429

Int. Cl.⁴ F02D *11/10*

U.S. Cl. 123—339 **1 Claim**



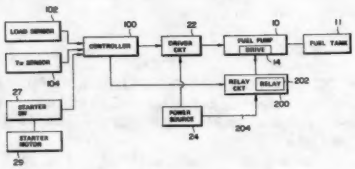
1. A device for controlling engine RPM, comprising:

(a) means for setting a reference engine RPM;
(b) means for detecting an instantaneous engine RPM;
(c) means for computing a control signal based on the difference between the engine RPM detected by said detecting means and the reference engine RPM and for changing the engine RPM in response to the control signal;
(d) a load switch for detecting a load energization setting or a load de-energization setting of an engine load, wherein said means for setting is responsive to said load switch to increase said reference engine RPM when a load energization setting is detected and to decrease said reference engine RPM when a load de-energization setting is detected, said increase in the reference engine RPM lasting for the duration said load is operatively connected to the engine;
(e) a load compensator for adding a predetermined load compensation signal, dependent on the load setting detected by said load switch, to said control signal; and
(f) load drive means responsive to said load switch detection and said instantaneous RPM for actuating or de-actuating said load in accordance with the status of said load switch, said drive means being operative to actuate or de-actuate said load when said instantaneous RPM is near the reference RPM set by said setting means upon switching of said load switch.

4,577,604
CONTROL SYSTEM FOR FUEL PUMP FOR INTERNAL COMBUSTION ENGINE

Yoichi Hara, Hiratsuka, and Yasuo Seimiya, Kanagawa, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Sep. 28, 1984, Ser. No. 655,554
Int. Cl.[4] F02M *19/00*
U.S. Cl. 123—397 **14 Claims**

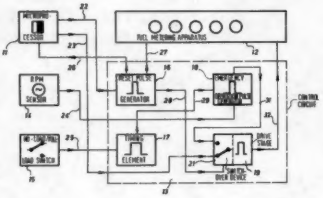


1. A control system for a fuel pump in a fuel supply system for an internal combustion engine comprising:
a fuel pump driver associated with said fuel pump to drive the latter at a controlled speed;
a sensor for monitoring a preselected engine operating parameter and producing a sensor signal indicative of the engine operating parameter;
a controller responsive to said sensor signal for deriving a desired fuel pump speed value on the basis of the value of said sensor signal and operating said fuel pump driver to drive said fuel pump in accordance with said desired speed in one of a predetermined speed range defined by a first maximum speed and a second minimum speed, and a predetermined ultimate speed in excess of said first speed and said controller being responsive to the sensor signal representative of a desired fuel pump speed in excess of said first maximum speed to operate said fuel pump driver to drive said fuel pump at said ultimate speed.

4,577,605
ARRANGEMENT FOR CONTROLLING A FUEL METERING APPARATUS AND HAVING AN EMERGENCY COTROL SYSTEM

Herbert Arnold, Eberdingen; Michael Horbelt, Schwieberdingen; Berthold Seibel, Kornwestheim; Hans-Peter Ströbele, Stuttgart, and Peter Werner, Wiernsheim, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 21, 1984, Ser. No. 673,869
Claims priority, application Fed. Rep. of Germany, Nov. 24, 1983, 3342379
Int. Cl.[4] F02M *51/00*
U.S. Cl. 123—479 **12 Claims**



1. An arrangement for controlling a fuel metering apparatus of an internal combustion engine such as for a motor vehicle, the arrangement comprising:
a microprocessor for generating control pulses corresponding to a program for controlling said fuel metering apparatus, said microprocessor including monitor means for transmitting check pulses indicative of a normal operation of said microprocessor;
a driver stage having an input connected to said microprocessor for receiving said control pulses and having an output for transmitting said control pulses on to said fuel metering apparatus;
a reset pulse generator for receiving said control pulses and for supplying, in the absence of said control pulses, a restart pulse to said microprocessor to restart said program;
an emergency control system for controlling the operation of said fuel metering apparatus in the event of a malfunction of said microprocessor, the emergency control system including: circuit means for recognizing the absence of said control pulses and for generating a switching pulse in response to said absence; an emergency operation pulse generator for generating pulses to control said fuel metering apparatus; and, switching means actuable in response to said switching pulse for separating said input of said driver stage from said microprocessor and connecting the same to the output of said emergency operation pulse generator;
timing means for generating pulses for determining the duration of said pulses generated by said emergency operation pulse generator; and,
a no-load switch/full-load switch operatively connected to said timing means;
said timing means including means for adjusting the duration of said pulses generated thereby in dependence upon the position of said no-load/full-load switch.

4,577,606
PRESSURE VALVE ASSEMBLY FOR FUEL INJECTION PUMPS

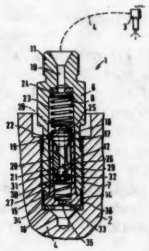
Wilfried Böhringer, Flein; Franz Eheim, deceased, late of Stuttgart (by Helga Eheim, legal representative); Wolfgang Fehlmann; Helmut Laufer, both of Stuttgart, and Karl Zibold, Asperg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 13, 1984, Ser. No. 671,432

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1983, 3341575

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—506 **15 Claims**



1. A pressure valve, which is inserted in a fuel delivery conduit between a pump working chamber of a fuel injection pump and an injection valve of an internal-combustion engine, and comprising a connection element **(6)** having an axial recess **(8)** at a pump-side thereof and a connection channel **(10)** extended from said recess and connectable to the fuel delivery conduit; a valve member **(12)** provided with a valve seat **(17)** and having a periphery and formed with a flange **(14)** at said periphery, said connection element having at the pump side an end face **(15)**, said pump having a housing receiving the pressure valve and being formed with a shoulder **(16)**, said flange being clamped between said end face **(15)** and said shoulder **(16)**, said valve member having a through passage **(21)**; a locking member **(19)** cooperating with said valve seat; a compression spring **(23)** positioned in said axial recess at a side thereof facing said channel, said locking member being inserted between said valve seat and said compression spring and including an axial passage **(26)**; a back-pressure relief valve **(30, 60)** including a closing member **(31)** for closing said axial passage **(26)** and a compression spring **(34)** which is fixedly supported at least immediately on said valve member, said axial passage being connected with said axial recess; throttle means **(28)** connecting said axial passage with said axial recess at the side thereof facing said connection channel, said valve member having an axial bore **(44)** forming said through passage; and a sleeve pressed in said axial bore and forming a support for the compression spring of the back-pressure relief passage.

4,577,607
CONTROL VALVE DEVICE

Shigeru Nishio, Kariya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed May 15, 1984, Ser. No. 610,432

Claims priority, application Japan, May 20, 1983, 58-087578; Sep. 12, 1983, 58-168544; Sep. 26, 1983, 58-177679; Sep. 28, 1983, 58-181438

Int. Cl.[4] F02M *33/02, 5/08*

U.S. Cl. 123—516 **7 Claims**

1. A control valve device for an internal combustion engine having a carburetor outer vent control system, a carburetor float chamber and a canister, said device controlling fluid communication in a fluid passage in response to an input current signal from a switch device and changes in ambient temperature, comprising:

a body member having an inlet port and an outlet port;

a fluid passage formed in said body member and connecting said inlet port and said outlet port;

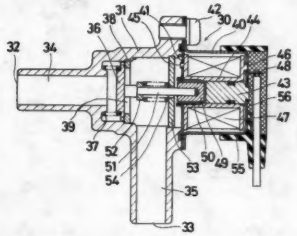
a valve member disposed in said fluid passage and controlling fluid communication in said fluid passage;

a first spring biasing said valve member in a direction closing said fluid passage;

a solenoid coil connected to said body member forming a magnetic circuit by receiving an input current;

a plunger member positioned in said magnetic circuit and attracted by an inner core upon energization of said solenoid coil;

a shaft fixed to said plunger member at one end and facing said valve member at the opposite end;



a second spring biasing said valve member in a direction opening said fluid passage, wherein said second spring is coil-shaped, is made of a shape memory alloy and is expandable to a memorized shape at a high temperature; and

a retainer member made of a heat insulating material interposed between said solenoid coil and said second spring so as to thermally insulate said second spring from said solenoid coil wherein said inlet port is connected to said carburetor float chamber and said outlet port is connected with said canister of said internal combustion engine and wherein said device is installed in said carburetor float chamber.

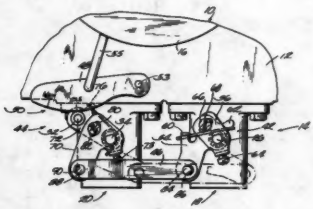
4,577,608
CARBURETION SYSTEM INCLUDING AN ADJUSTABLE THROTTLE LINKAGE

Chester G. DuBois, Zion, and John D. Flaig, Libertyville, both of Ill., assignors to Outboard Marine Corporation, Waukega, Ill.

Filed Jul. 27, 1984, Ser. No. 635,240

Int. Cl.[4] F02B *13/00*

U.S. Cl. 123—583 **9 Claims**



1. A throttle linkage assembly comprising a throttle shaft rotatable about a throttle shaft axis between an idle position and a wide open throttle position, a throttle plate fixed on said throttle shaft, a driven lever pivotable about said throttle shaft axis between various angles relative to said throttle plate, and means for fixing said driven lever at a selected angle relative to said throttle plate an adjustment lever fixedly connected to said

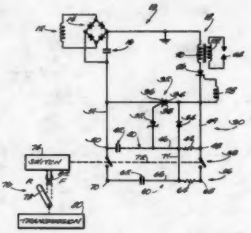
throttle adjacent said driven lever, and means for releasably securing said driven lever to said adjustment lever.

4,577,609

CD IGNITION SYSTEM WITH SPARK RETARD IN NEUTRAL

James A. Donohue, Pewaukee, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Dec. 7, 1984, Ser. No. 679,576
Int. Cl.[4] F02P *3/00*
U.S. Cl. 123—602 **25 Claims**



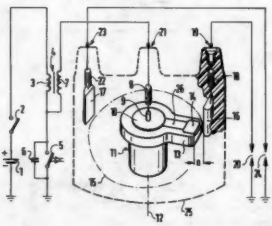
1. A capacitor discharge ignition circuit adapted for use with an internal combustion engine, said circuit comprising a charge capacitor, a primary ignition coil, an ignition SCR, first spark retard circuit means in series with said charge capacitor, said ignition SCR, and said primary coil and operative for selectively preventing discharge of said capacitor through said primary coil for a first predetermined period of time after said ignition SCR is rendered conductive, thereby providing for automatic spark retard at higher engine rpm, second spark retard circuit means connectable to said first spark retard circuit means for further preventing discharge of said capacitor through said primary coil for a second predetermined period of time in addition to said first predetermined period of time after said ignition SCR is rendered conductive, and means for connecting said second spark retard circuit means to said first spark retard circuit means when said engine is in neutral.

4,577,610

IGNITION DISTRIBUTOR SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Jürgen Schmatz, Mundelsheim, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 10, 1984, Ser. No. 648,666
Claims priority, application Fed. Rep. of Germany, Dec. 29, 1983, 3347409
Int. Cl.[4] H01H *19/00*
U.S. Cl. 123—633 **16 Claims**



1. A simplified, radio-noise-suppressing ignition distributor, for a multi-cylinder Otto-type internal combustion engine, comprising

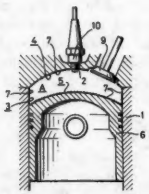
a housing (25);
a rotor (13) of insulating material;
a unitary constructional element embedded in the rotor (13) and having portions, of the same material, defining a center terminal (10), a peripheral distributor terminal (14), and an electrically-high-conductivity connection (26) between the center terminal (10) and the peripheral distributor terminal (14);
a center connecting terminal (9) of carbon secured to the housing (25) and positioned for sliding contact under spring pressure with the center terminal (10) of the rotor (13);
a center ignition coil cable connector (21) secured to the housing (25);
peripheral spark plug cable terminal connectors (19, 23) secured substantially within the housing;
gap terminals (16, 17) peripherally positioned within the housing, and located so that the peripheral distributor terminal (14) of the rotor (13), upon rotation thereof, sweeps past said gap terminals (16, 17);
a noise suppression resistor (8) connected between said center connecting terminal (9) and said ignition coil cable connector (21);
and at least one radio noise suppression resistor (18, 22) electrically connected between each of the peripheral cable connectors (19, 23) and the associated terminal (16, 17);
and wherein the peripheral terminal (14) of the rotor is positioned on said rotor (13) with a spacing (a) of between 0.5 and 3 mm from each gap terminal (16, 17) when rotationally aligned respectively therewith.

4,577,611

RECIPROCATING INTERNAL-COMBUSTION ENGINE OF LOW-TEMPERATURE CATALYTIC-COMBUSTION TYPE

Shigeo Hagino, No. 953, Oizumigakuenmachi, Nerima-ku, Tokyo, Japan

Filed May 28, 1982, Ser. No. 382,944
Claims priority, application Japan, Jun. 5, 1981, 56-85679
Int. Cl.[4] F02B *75/08*
U.S. Cl. 123—669 **6 Claims**



1. A reciprocating combustion engine powered by an air-fuel mixture and which includes a reciprocal piston and a cylinder defining a combustion chamber, said piston having a head which includes a top surface, said combustion chamber having inner walls with a piston-sliding region and areas separate from the piston-sliding region, along which areas a relatively thin low-temperature quench layer is formed juxtaposed thereto during operation of the engine, characterized by the improvement that:

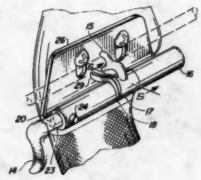
surfaces of the inner wall of said chamber at the areas separate from the piston-sliding region and including at least the entire top surface of the piston head of said piston are coated with a means for promoting complete combustion of at least the quench layer using a catalyst layer comprising a catalyst carried on a carrier, said catalyst consisting of a powdered metal selected from platinum group metals, which catalyst is adapted to initiate catalytic non-flame combustion of the air fuel mixture in the quench layer formed along said areas which are at a temperature below

250° C. during an initial period of combustion of said mixture and which do not exceed 500° C. during the course operation of the engine.

4,577,612
ARROW HOLDER

John T. Zell, 2676 Clute Rd., Boyne City, Mich. 49712, assignor to John T. Zell, Boyne City and Michael R. Franchino, Petoskey, both of, Mich.

Filed Jun. 18, 1984, Ser. No. 621,368
Int. Cl.⁴ F41D *10/00*; F41B *5/00*
U.S. Cl. 124—41 A **5 Claims**



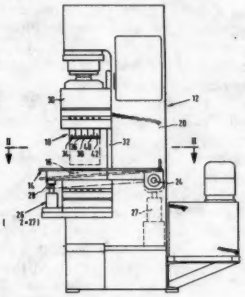
1. An arrow holder which may be attached to an archery bow which comprises:
   a. a rotatable arrow clamp,
   b. a trigger,
   c. a means for biasing the arrow clamp toward the body of the bow when the trigger is not depressed,
   d. a hollow arrow clamp collar onto which the arrow clamp is mounted,
   e. a follower affixed to the inner surface of the hollow arrow clamp collar,
   f. a rotation lock pin,
   g. a hollow trigger shaft sleeve having a rotation lock aperture, which may accommodate the insertion of said rotation lock pin, the hollow trigger shaft sleeve comprising two hollow sections separated by the axial length of the arrow clamp collar so as to facilitate coaxial alignment of the two sections and the collar, and
   h. a trigger shaft onto which the trigger is mounted and which may be inserted into the hollow passage provided by the trigger shaft sleeve and the arrow clamp collar when coaxially aligned, the trigger shaft also comprising a rotation lock groove which aligns with the rotation lock pin when inserted in the rotation lock aperture, and further comprises a spiral passageway which aligns with the follower so as to cause the arrow clamp to be rotated away from the body of the bow when the trigger is depressed.

4,577,613
PAVEMENT AND MASONRY STONE CUTTER

Friedhelm Porsfeld, Spitalhofstr. 86, 8390 Passau, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 378,490, May 14, 1982, abandoned. This application Nov. 6, 1984, Ser. No. 668,869
Claims priority, application Fed. Rep. of Germany, May 18, 1981, 3119693; May 18, 1981, 3119694
Int. Cl.⁴ B28D *1/32*
U.S. Cl. 125—23 C **19 Claims**

1. A pavement and masonry stone cutter apparatus comprising an upper tool drive so as to reciprocate in a frame and cooperating with a lower tool, said upper and lower tools each comprising a plurality of individual cleaving wedges which are movable relative to one another in a cutting direction, at least one of said upper and lower tools being movable in response to a pumped fluid, improvement comprising said frame being C-shaped and including a supporting table having a slot-like opening for passage of said lower tool, said apparatus including a fluid operated piston and cylinder unit with said unit including a piston rod, said supporting table having an inner end which is pivotably mounted on said C-shaped frame and an outer end supported by means of said rod of said fluid operated piston and cylinder unit for moving said supporting table down during a cutting operation and moving said table up again to a starting position upon the completion of a cutting operation, said movement upward to said starting position of said supporting table corresponding to the return movement of said upper tool, said lower tool being positioned below the top of said supporting table when said supporting table is in said

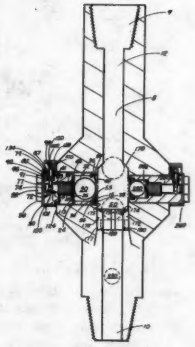


starting position, said piston and cylinder unit being associated with fluid system including a pressure limiting valve for deactivating said unit in a controlled manner during a cutting operation whereby said supporting table is tilted in a downward direction regardless of the weight of the rock to be cut, said piston and cylinder unit for said supporting table being actuatable to raise said table to its starting position after said cutting operation so that said lower tool will lie below the surface of said supporting table.

4,577,614
ADVANCED QUICK BALL RELEASE SUB

William N. Schoeffler, P.O. Box 91105, Lafayette, La. 70509

Filed May 2, 1983, Ser. No. 490,555
Int. Cl.⁴ E21B *21/08*
U.S. Cl. 125—25 **4 Claims**



1. A quick ball release blowout preventor apparatus mounted above a kelly for preventing oil and gas well blowouts occasioned by excessive downhole pressure, comprising:
   (a) a sub-assembly fluidly connected on its top end to a fluid flow passageway of a kelly cock valve and on its bottom end to a fluid flow passageway of a drillstring intermediate the kelly, wherein said sub-assembly is provided with a longitudinal bore therethrough and a transverse bore

through one side thereof, said transverse bore directly communicating with said longitudinal bore at its inner end, and wherein further, said sub-assembly comprises a valve seat disposed within said longitudinal bore and a ball securing means positioned downstream of said valve seat in the longitudinal bore;

(b) a ball valve release mechanism mounted substantially within the transverse bore, comprising a head portion and a stud portion extending inwardly into the transverse bore from said head portion, wherein said stud portion comprises:

i. an internal chamber having an inner end disposed in direct communication with said longitudinal bore of said sub-assembly;

ii. a ball mounted within said internal chamber;

iii. a ball retainer means;

iv. a plunger means mounted within said chamber and engaging the ball on the opposite side from said ball retainer means;

v. an actuator means disposed in functional relationship to said plunger mechanism actuatable by external means to selectively actuate said plunger means between an operating and non-operating mode, said actuator means comprising an actuator pin having a head portion and a downwardly extending shank portion, a collar circumferentially mounted onto the stud portion of the ball valve release mechanism adjacent the head portion thereof; and

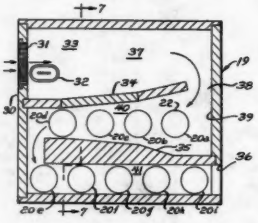
vi a means for transmitting rotational force to the actuator collar, said means for transmitting rotational force comprising a cable attached to said actuator collar and extending downwardly therefrom to enable personnel situated on an oilrig floor to exert a downward pull thereto, to thereby impart rotational force to said collar and actuate the plunger.

4,577,615

HEAT PIPE CENTRAL FURNACE

Ronald S. Tomlinson, Antioch Township, Davidson County, Tenn., assignor to Heil-Quaker Corporation, Lewisburg, Tenn.

Filed Dec. 24, 1984, Ser. No. 685,711
Int. Cl.[4] F24H *3/00*
U.S. Cl. 126—99 A **24 Claims**



1. In a furnace having input heat source means, means defining a heat exchange chamber having heat input and heat output portions, said heat input exchange portion including an input heat transfer chamber, and means for conducting a fluid to be heated through said heat exchange output portion of the heat exchange chamber for transfer of heat to said fluid, the improvement comprising:

a plurality of heat pipes each having an evaporator portion, a condenser portion, and a condensable heat transfer fluid therein, at least a given number of said evaporator portions being arrranged to serially receive heat from said input heat source means in said heat transfer chamber; and

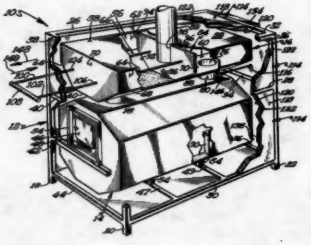
means for uniformly loading said given number of said serially heated heat pipes in said heat input portion as an incident of transferring said heat from the input heat source means through said evaporator portions and condenser portions of said heat pipes to said fluid to be heated in said heat exchange chamber output portion.

4,577,616

WOOD BURNING FURNACE

Arnold D. Lillo, Rte. 1, Box 111, Good Thunder, Minn. 56037

Filed Dec. 10, 1984, Ser. No. 679,644
Int. Cl.[4] F24H *3/02*
U.S. Cl. 126—110 R **9 Claims**



1. An improved furnace for burning wood and which is resistant to creosote deposits from smoke comprising:

an upright frame;

a fire box carried by said frame and having a door for the insertion of the wood;

a heat exchanger carried on said fire box and having an interior chamber with a top and bottom;

means connecting said fire box and said heat exchanger and directing smoke from said fire box into said exchanger chamber;

a chimney stack fixed to and extending upwardly from said exchanger to discharge smoke, said stack also extending substantially downwardly within said exchanger chamber to receive smoke from adjacent the bottom of said chamber to thereby retain hot smoke adjacent the top of said exchanger for an increased time interval to allow additional heat transfer from the smoke to said exchanger;

an insulative housing carried on said frame to define an air plenum within said housing and about said fire box and exchanger to permit air in said plenum to be heated by contact with said fire box and said exchanger; and

an air inlet for cold air to enter said plenum and an air outlet by which heated air may leave said plenum.

4,577,617

VESTIBULE FOR ANY STOVE

Frank Fusco, Pennsylvania-U.S.A.

Filed Nov. 19, 1984, Ser. No. 673,033
Int. Cl.[4] F24C *15/08*
U.S. Cl. 126—279 **2 Claims**

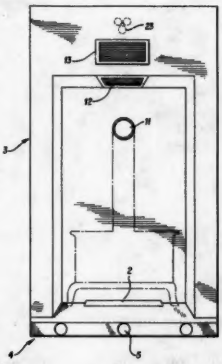
1. A vestibule for a stove which will accommodate any stove or heater of different sizes and shapes for separating the stove or heater from the floor and wall of a room, said vestibule comprising

(a) a platform arranged to form the bottom wall of said vestibule, opposite sidewalls extending upwardly from said platform, a backwall extending between said sidewalls, and a top wall at the upper ends of said opposite side and back wall, said vestibule having an opened front,

(b) said platform including a top surface for supporting the stove or heater and also including a vertical front surface having lower air inlet openings therein, a lower air outlet opening in said top surface of the platform adjacent the backwall, lower conduit means in said platform for communicating said lower air inlet openings with said lower

air outlet opening, and first electrically operated forced air circulating means positioned in said lower conduit means for drawing room air into said lower air inlet openings and forcing said air out of said lower air outlet opening whereby said air is heated by the radiation of the heat of the stove or heater through said top surface of the platform,

(c) said top wall including a bottom surface and a vertical front surface, an upper air inlet openings in said bottom surface of the top wall and an upper air outlet opening in



said front surface of the top wall, upper conduit means in said top wall for communicating said upper air inlet opening with said upper air outlet opening, and second electrically operated forced air circulating means positioned in said upper conduit means for drawing room air into said upper air inlet opening and forcing said air out of said upper air outlet opening whereby said air is heated by the radiation and convection from the heat of the stove or heater through said bottom surface of the top wall, and

(d) said backwall having an aperture therein for accommodating a flue pipe of the stove or heater.

4,577,618

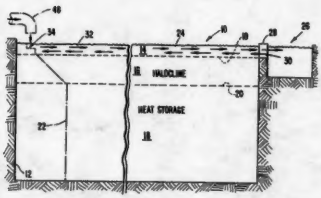
METHOD OF AND APPARATUS FOR DYNAMICALLY STABILIZING THE WIND-MIXED LAYER OF A SOLAR-WATER POND

Gad Assaf, Rehovot, Israel, assignor to Solmat Systems Ltd., Yavne, Israel

Continuation of Ser. No. 396,759, Jul. 9, 1982, Pat. No. 4,553,529. This application Aug. 6, 1984, Ser. No. 637,699

Int. Cl.[4] F24J *3/02*

U.S. Cl. 126—415 **3 Claims**



1. A method for dynamically stabilizing the convective wind-mixed layer of a salt-water solar pond, which covers a nonconvective halocline, the method comprising providing a source of brine whose salinity differs from the salinity of the water in the wind-mixed layer, and exchanging brine between the source and the wind-mixed layer for creating a two-layer flow regime in the wind-mixed layer due to differences in salinity whereby lighter less dense water flows adjacent the surface of the pond into the source, and heavier, more dense water, flows beneath the lighter water out of the source.

2. A solar pond comprising:

(a) a convective wind-mixed layer of water on the surface of the pond;

(b) a nonconvective halocline covered by the wind-mixed layer having a density that increases with depth;

(c) a heat storage layer under the halocline for storing heat created in the pond by the absorption of solar radiation; and

(d) a reservoir associated with the wind-mixed layer and containing water whose salinity is different from the average salinity of water in the wind-mixed layer, and means to exchange water between the reservoir and the wind-mixed layer for establishing a two-layer flow regime in the wind-mixed layer due to a difference in salinity between the layers whereby lighter less dense water flows adjacent the surface of the pond into the reservoir, and heavier, more dense water, flows beneath the lighter water out of the reservoir.

4,577,619

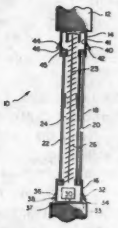
ENERGY EFFICIENT WINDOW AND SKYLIGHT ASSEMBLIES

William C. Howe, Jr., 4311 Park View Dr., Salt Lake City, Utah 84117

Filed Sep. 8, 1983, Ser. No. 531,172

Int. Cl.[4] E04D *13/18*

U.S. Cl. 126—431 **19 Claims**



1. A totally self-contained apparatus for use as a window or skylight assembly, and adapted for simultaneously controlling the amount of both sunlight and air admitted into a building, said apparatus comprising:

a head member and a sill member;

a first sheet of material through which sunlight can pass, said first sheet of material forming a major portion of the exterior surface of said apparatus and being mounted between said head and sill members;

a second sheet of material through which sunlight can pass, said second sheet of material being spaced from said first sheet of material said second sheet of material forming a major portion of the interior surface of said window apparatus and being mounted between said head and sill members;

first and second window jams positioned between said first and second sheets of material and extending from said head member to said sill member so as to form an essentially enclosed air flow channel;

means, positioned in said air flow channel, for regulating the amount of sunlight passing through said apparatus; and

ventilation means for directing air through said air flow channel, and comprising a motor-driven fan mounted within said air flow channel at one end thereof so as to circulate air through said air flow channel together with a plurality of apertures disposed in said head and sill mem-

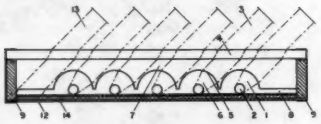
bers for placing said air flow channel in communication with the interior and exterior of said building and means for selectively opening and closing said apertures whereby air may selectively flow from one of (a) the outside to the inside of said building, (b) from the inside to the outside of said building, (c) from the inside of said building through said air flow channel and back to the inside of said building and (d) from the outside of said building through said air flow channel and back to the outside of said building.

4,577,620

HEMISPHERIC SOLAR PANEL

John E. Clegg, 2320 Keystone Dr., Orlando, Fla. 32806

Filed Feb. 25, 1985, Ser. No. 705,153
Int. Cl.[4] F24J *2/24*
U.S. Cl. 126—440 **1 Claim**



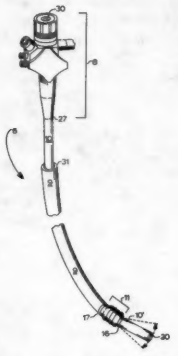
1. A hemispheric solar panel comprising;
an array of multiple hemispheric lenses (1) having concentric outer and inner spherical faces and arranged in parallel rows and integrally mounted on a planar glass base plate (8) occupying a horizontal plane below said hemispheric lenses (1),
multiple solid heat-absorbing metal spheres (2) embedded in the center of said hemispheric lenses (1),
a metal base plate (12) mounted below said glass base plate (8),
a sheet (14) of thermal insulation mounted below said metal base plate (12),
a top glass plate (4) mounted above said hemispheric lenses (1) and spatially separated therefrom,
two opposed parallel vertical side walls (9),
two opposed parallel vertical end walls,
a fluid conduit (7) having a top formed by said top glass plate (4), having a base formed by said hemispheric lenses (1) and by said glass base plate (8), having sides formed by said two opposed parallel vertical side walls (9), and having ends formed by said two opposed parallel vertical end walls,
an inlet pipe (10) opening into said fluid conduit (7) through one said parallel end wall, and
an outlet pipe (11) opening into said fluid conduit (7) through the opposite said parallel end wall;
said hemispheric lenses (1) serving as mounting means of said metal spheres (2), serving as means of focusing solar beams (6) onto said metal spheres (2), serving as means of absorbing heat from said metal spheres (2) and conducting the heat to a fluid flowing through said fluid conduit (7), and serving as a basal portion of said fluid conduit (7),
said glass base plate (8) serving as mounting means of said hemispheric lenses (1) and serving as a basal portion of said fluid conduit (7),
said metal spheres (2) serving as elements which absorb the heat of said solar beams (6) and which release the heat to said hemispheric lenses (1) and to said metal base plate (12),
said metal base plate (12) serving as an element which absorbs the heat of solar beams (13) and of said metal spheres (2) and which releases the heat to said glass base plate (8),
said top glass plate (4) serving as a window which transmits solar beams (3) to said hemispheric lenses (1) and to said glass base plate (8),
said fluid conduit (7) serving as a channel through which a heat-transfer fluid flows.

4,577,621

ENDOSCOPE HAVING NOVEL PROXIMATE AND DISTAL PORTIONS

Jayendrakumar I. Patel, 502 Rector St., Valdese, N.C. 28690

Filed Dec. 3, 1984, Ser. No. 677,558
Int. Cl.[4] A61B *1/06*
U.S. Cl. 128—4 **13 Claims**



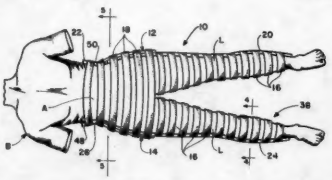
1. An endoscope comprising:
(a) a control unit;
(b) a first flexible tube member having a proximate end portion in optical communication with the control unit, a body portion and a distal end portion having a free end containing means therein to transmit light to and from said control unit so that images outside of the distal portion may be illuminated and viewed through the control unit and the proximate end portion;
(c) a second flexible tube member having a proximate and distal end portions and a body portion partially circumscribing the body portion of said first tube member; and,
(d) a first expansion and contraction means attached to the distal end portion of the second flexible tube member and to the first flexible tube member at a point other than its distal portion so that it will expand and contract along its own and the longitudinal axis of the first and second flexible tube members.

4,577,622

ANTI-SHOCK TREATMENT METHOD AND GARMENT

Thomas J. Jennings, 5011c Cheswick, Dayton, Ohio 45431

Filed Jul. 12, 1984, Ser. No. 630,159
Int. Cl.[4] A61F *13/08;* **A61H** *11/00*
U.S. Cl. 128—24 R **3 Claims**



1. An improved anti-shock treatment method, consisting of the steps of:
(a) supporting a series of resilient, stretchable straps on a first set of rods positioned along the midline of the outer side of each of the legs of a shock victim;
(b) stretching each of said straps about a portion of each leg;
(c) detachably fastening each strap about said leg portion in

a stretched condition which applies pressure about said leg portion;

(d) applying each strap in a stretched condition about an adjacent portion of each leg in a sequence beginning with a lowermost strap and proceeding strap by strap upwardly along said leg so as to create a milking action on blood contained within said leg which tends to return the same to the heart of said victim;

(e) supporting a series of resilient, stretchable belts on a second set of rods slidably interconnected with said first set of rods and positioned along the midline of the outer sides of the abdomen of said victim;

(f) stretching each of said belts about a portion of the abdomen;

(g) detachably fastening each belt about said abdomen portion in a stretched condition which applies pressure about said abdomen portion; and

(h) applying each belt in a stretched condition about an adjacent portion of the abdomen in a sequence beginning with a lowermost belt and proceeding belt by belt upwardly along said abdomen after application of the sequence of straps has been completed so to continue creation of the milking action on blood contained in the abdomen of the victim.

4,577,623

SPLINT MOBILIZING AN UPPER LIMB

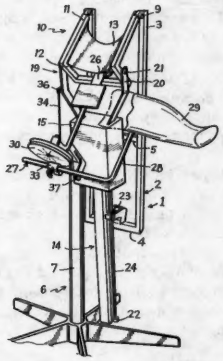
Jean C. Pecheux, Charleville Mezieres, France, assignor to Compagnie Generale de Materiel Orthopedique, France

Filed Nov. 3, 1983, Ser. No. 549,242

Claims priority, application France, Nov. 8, 1982, 82 19102

Int. Cl.[4] A61H *1/02*; A63B *21/24*

U.S. Cl. 128—25 R **11 Claims**



1. A splint allowing mobilization of an upper limb, wherein it comprises a vertical framework supporting, in its upper part, a brachial cradle which is articulated about a horizontal geometrical axis intended substantially to coincide with the scapulo-humeral joint of the upper limb, and which is connected to the frame by a drive member capable of pivoting the cradle about said axis in abduction/adduction movements with respect to the framework, said cradle being provided with an adjustable axial extension bearing a bent bar whose part substantially parallel to the extension supports an adjustable antebrachial splint.

4,577,624

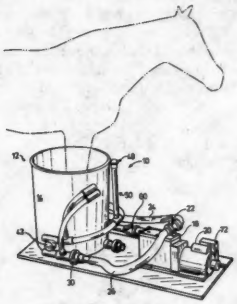
HYDROMASSAGE AND WHIRLPOOL BATH

Larry Patton, 38 Guardsman Rd., Thornhill, Ontario, Canada

Continuation-in-part of Ser. No. 416,955, Sep. 13, 1982, abandoned. This application Jun. 15, 1984, Ser. No. 621,258

Int. Cl.[3] A61N *1/100*

U.S. Cl. 128—40 **2 Claims**



1. A hydromassage and whirlpool bath for massaging the legs of four legged animals, comprising:

(a) a bath container having a center, a bottom and peripheral upstanding wall formation made from yieldable plastics material, the wall formation upstanding from the bottom and enclosing the bath container;

(b) a water suction outlet secured to the lower part of the peripheral wall;

(c) massage means consisting of four multi-directional jets secured to the bath, two proximate the bottom and two proximate the top of the wall formation the jets for directing a mixture of water and air into the bath, the two lower jets being substantially diametrically opposed on the peripheral wall formation equally spaced from the water suction outlet, the other two jets being circumferentially disposed between the two lower jets on either side of the outlet, the circumferential distances between one of the upper jets and the nearest lower jet to it, and the other upper jet and nearest lower jet to it being about equal, the upper jets forming together with the center of the bath, an angle of about 90° and the distance between one of the lower jets and the outlet and the other lower jet and the outlet being about equal, and the distance between one of the upper jets and the outlet and the other upper jet and the outlet being about equal;

(d) a pump adjacent to the bath container provided with means comprising tubing to pump water through the jets in the bath;

(e) an air injector means secured to the tubing carrying water to the bath for injecting air into the water;

(f) further tubing connecting the suction outlet to the pump and

(g) a motor secured to the pump for operating the pump.

4,577,625

ROTATING BALL MASSAGER

Aladar Lohati, and Gizella Lohati, both of 1310 Morningside Way, Venice, Calif. 90291

PCT No. PCT/US82/01621, § 371 Date Mar. 6, 1984, § 102(e) Date Mar. 6, 1984, PCT Pub. No. WO84/02410, PCT Pub. Date Jun. 21, 1984

PCT Filed Nov. 15, 1982, Ser. No. 600,555

Int. Cl.[4] A61H *15/00*

U.S. Cl. 128—57 **7 Claims**

1. An improved rotating ball massager comprising:

(a) a flexible hand enclosure

(b) a side strip of flexible material wrapped and attached

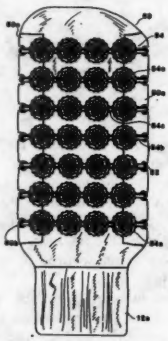
around the side edges of said hand enclosure with said strip having a plurality of slots cut perpendicular to the length of the enclosure where the slots provide an opening into the side surface of said hand enclosure,

(c) means for attaching said side strip to the side of said flexible hand enclosure,

(d) a cross-joint comprised of a horizontal rod and a vertical tube having an upper and lower opening where the vertical tube is centrally attached at 90-degrees to the side of the horizontal rod, and where the horizontal rod is slipped into the slot and held within the side strip by the pressure of the side strip against the side edges of said hand enclosure, and where the upper and lower openings of said cross-joint extend slightly above and below said side strip,

(e) means for attaching the vertical tube to the side of the horizontal rod on said cross-joint,

(f) a rotating circular bead assembly comprising:



(1) a plurality of circular knurled beads each having a central bore therethrough,

(2) a bead retaining rod having a horizontal center section with a contiguous downwardly angled vertical section on each end, with said rod having a diameter that allows the knurled beads to be easily inserted and rotated about the horizontal center section and where the length and diameter of the vertical section is sized to fit into and be captively held within the upper and lower openings of the vertical tube on said cross joint, and where the length of the vertical section is also selected to allow the beads to easily rotate against the surface of said enclosure, and

(g) means for captively holding the vertical sections of the bead retaining rod within the respective vertical tube openings on said cross-joint.

4,577,626

MASSAGER

Toshio Marukawa; Haruki Nakao, and Toshio Mikiya, all of Tokyo, Japan, assignors to Nikki Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 233,079, Feb. 9, 1981, abandoned. This application Oct. 9, 1984, Ser. No. 658,465

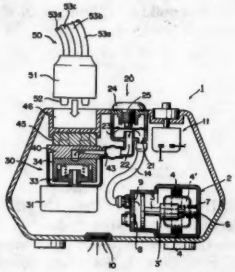
Int. Cl.[4] A61H *7/00*

U.S. Cl. 128—64 **6 Claims**

1. A massager comprising:

an electromagnetic linear compressor for producing compressed air and which has a compression chamber with an intake port and a discharge port, a piston slidably mounted within said compression chamber and movable in a direction into and a direction out of said compression chamber for compressing air therein and further having an armature thereon which is capable of being attracted by a magnetic force, a coil spring engaged with said piston for urging said piston in a direction into said compression chamber, and an electromagnet means adjacent the path of movement of said piston for generating a magnetic force when current is applied thereto and positioned for applying a magnetic force to said armature for moving said piston out of said compression chamber against the force of said coil spring;

distributing means having a stationary member having a central air admission passage opening out of one end thereof and connected with the discharge port of said compressor, and having a compressed air inlet passage opening into said air admission passage and a plurality of exhaust ports extending through said stationary member from said one end to the other and spaced along a circle around the central air admission passage; a rotary member having one end engaged against said one end of said stationary member and rotatable relative thereto about an axis of rotation concentric with said circle and having a connecting recess in said one end with one end on the axis of rotation and aligned with said central air admission passage and the other end on said circle for successively communicating said central air admission passage and said



exhaust ports as said rotary member rotates, and at least one throttle hole substantially smaller in diameter than said exhaust ports extending through said rotary member from said one end to the other and lying on said circle and behind, relative to the direction of rotation of said rotary member, said connecting recess; a motor having a drive shaft; a rotary disk mounted on said drive shaft and in driving engagement with said rotary member; and a spring between said rotary disk and said rotary member urging said rotary member into engagement with said stationary member;

at least one bag means shaped for being wound directly around a part to be massaged, said bag means having a plurality of air tight sections which are expanded by the force of compressed air; and

air delivering means connected between said exhaust ports of said distributing means and said bag means for delivering compressed air from the respective exhaust ports of said distributing means and the corresponding sections of said bag means, said air delivering means having no safety valve means.

4,577,627

ANTERIOR TRACTION MYOTATIC CHIN STRAP FOR THE TREATMENT OF MANDIBULAR RETROGNATHISM

Antonio Facal Garcia, Gran Via, 50-1°, Vigo, Spain

Filed Dec. 22, 1983, Ser. No. 564,551

Claims priority, application Spain, Apr. 18, 1983, 521.582

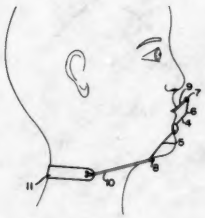
Int. Cl.[4] A61F *5/08*

U.S. Cl. 128—76 R **4 Claims**

1. An anterior traction myotatic appliance for the treatment of mandibular retrognathism or Skeletal Class II malocclusion, said appliance comprising:

a generally flat member anatomically configured to fit in the labiomenton groove of a patient;

a band to be applied around the back of the neck of the patient and connected to said member by means for causing, in cooperation with said band, said member to impart to the lower mandible of the patient a rearward and downward force, thereby causing excitation of the myotatic reflex action mandible advance wherein the muscles of the lower mandible stretch against said force and promote forward mandible growth; and



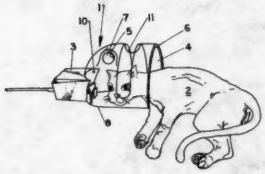
further means, extending from said member in a direction substantially opposite that of said first mentioned means and adapted to be connected to a conventional orthodontic appliance adapted to be inserted in the mouth of the patient, for imparting to the teeth of the patient a forward and upward force, thereby positioning the teeth favorably with respect to the position of the mandible at the end of treatment after said forward mandible growth.

4,577,628

OXYGEN DOME FOR SMALL ANIMALS

Horst R. Hickmann, 1455 Montegor, Cincinnati, Ohio 45230

Filed Feb. 25, 1985, Ser. No. 704,740
Int. Cl.[4] A61M *16/00*
U.S. Cl. 128—205.26 **14 Claims**



1. A dome to be used in inhalation therapy for small animals comprising:

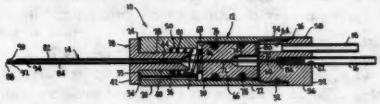
a dome having a first closed end portion and an opposite open end portion, said closed end portion being spherically shaped, said open end portion being semi-cylindrically shaped, said dome having at least one orifice for introducing one or more gases into the interior of the dome and a semicircular arcuate rib projecting into the interior of the dome, said at least one orifice being located between said rib and said closed end whereby said rib serves as a curtain to aid in maintaining any gas introduced into the interior of the dome through said at least one orifice, said open end portion terminating in a semicircular opening of sufficient size to permit the introduction of a small animal into the interior of said dome, said semicircular rib being spaced in close proximity to said semicircular opening.

4,577,629

SURGICAL CUTTING INSTRUMENT FOR OPHTHALMIC SURGERY

Miguel Martinez, Irvine, Calif., assignor to CooperVision, Inc., Irvine, Calif.

Filed Oct. 28, 1983, Ser. No. 546,418
Int. Cl.[4] A61B *17/32*
U.S. Cl. 128—305 **10 Claims**



1. A surgical cutting instrument useful in ophthalmic surgery comprising

a cylindrical, hollow body having a front end, a rear end and a centrally disposed chamber therein;

a front plug received in said front end of said body and having an axial bore therethrough;

a piston disposed in said chamber to be movable in a reciprocating manner toward and away from said front end, said piston carrying sealing means thereround and having a front end, a rear end and an axial bore therethrough with a widened portion adjacent said rear end of said piston;

spring means disposed in said body engaging said front end of said piston to bias said piston away from said front end of said body;

probe means including an elongate tubular outer member having a proximal end secured in said axial bore in said front plug, a closed distal end, and a port adjacent said distal end, and an elongate tubular inner member slidably disposed in said outer member and having a portion fixed in said axial bore in said piston and a distal end movable across said port to provide a cutting action;

a rear plug received in said rear end of said body and having an axial bore therethrough aligned with said probe inner member to permit passage of cut material through said surgical cutting instrument and a second bore therethrough communicating with said chamber for receiving pressure to move said piston and said probe inner member against the bias of said spring means; and

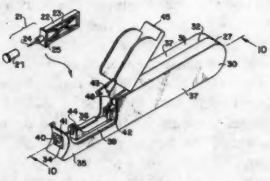
evacuating tube means communicating with said probe inner member and adapted to be connected with a source of suction to draw cut material through said probe inner member.

4,577,630

REUSABLE BREACH LOADING TARGET PRESSURE ACTIVATED LANCET FIRING DEVICE

Raymond P. Nitzsche, Edison, and Kenneth E. Geiger, Hackensack, both of N.J., assignors to Becton, Dickinson and Co., Paramus, N.J.

Filed Feb. 14, 1984, Ser. No. 580,056
Int. Cl.[4] A61B *17/34*
U.S. Cl. 128—314 **22 Claims**



1. A reusable breach loading target pressure activated lancet firing device for use with a lancet including a handle portion

and a lancet point extending outwardly from a distal end of the handle portion comprising:

a hollow housing including a distal end, a proximal end and a side wall therebetween, said housing having an aperture in said distal end and a side aperture defining a breach in said side wall;

a trigger member movably engaged in said housing having a distal end extending outwardly from said distal aperture;

a sled slidably engaged within said housing adjacent to said trigger member including lancet engagement means for releasably engaging the lancet handle portion in order to permit the lancet point to extend outwardly from a distal end of said sled when the lancet is engaged therein, said sled capable of sliding to a first rest position with said lancet engagement means being accessible from said side aperture, the lancet point being maintained internally of said distal aperture when the lancet handle portion is engaged in said lancet engagement means and said sled is in said first position;

a side hood substantially covering said side aperture, said hood being movably engaged to said housing so that said hood may be opened to expose said lancet engagement means;

spring means positioned in said housing for biasing the distal end of said sled toward the distal end of said housing;

sear means for holding said sled in a second position in a direction toward said proximal end of said housing so that said spring means is partially deflected and cooperating means on said side hood and said sled for facilitating the movement of said sled toward said proximal end of said housing, deflecting said spring means and engaging said sear means; and

trigger means for releasing said sear means and allowing said sled to slide toward said distal aperture to a third position, said sled being closer to said distal end of said housing in said third position than in said first position, the lancet point, when the lancet handle portion is engaged in said lancet engagement means, being positioned outwardly from said distal aperture when said sled is in said third position, the activation of said trigger means being responsive to contact pressure between the patient's skin in an area adjacent to the site of the intended skin puncture and said trigger member.

4,577,631

ANEURYSM REPAIR APPARATUS AND METHOD

Jeffry W. Kreamer, 5615 Forest Ave., Des Moines, Iowa 50311

Filed Nov. 16, 1984, Ser. No. 671,994

Int. Cl.[4] A61B *17/12*

U.S. Cl. 128—334 R **11 Claims**

1. A method for repairing inside the body a damaged section of a blood vessel, comprising the steps of:

a. making an incision into a vessel distal of and communicating with the damaged section of the blood vessel;

b. blocking the flow of blood through the vessel and the damaged section by inserting an occlusion catheter into the vessel through the incision and opening the catheter upstream of the damaged section of the vessel;

c. feeding into the vessel a prosthetic graft affixed temporarily to a second catheter, which graft extends longitudinally beyond the damaged section to healthy portions of the vessel; and

d. adhering the graft to healthy sections of the vessel on either side of the damaged section by an adhesive on the

outer periphery of the graft which is contacted to the vessel by the second catheter.

4,577,632

ARTICLE FOR INFANTS, FORMING PACIFIER AND TEETHING RING SIMULTANEOUSLY

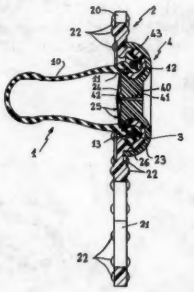
Joseph Grasset, Ecole Publique de Saint-Vidal, FR 43320 Loudes, France

Filed Feb. 6, 1984, Ser. No. 577,649

Claims priority, application France, Feb. 10, 1983, 83 02444

Int. Cl.[4] A61J *17/00*

U.S. Cl. 128—360 **5 Claims**



1. A pacifier article for infants, comprising:

an annular flange part having an opening therethrough;

a hollow elastic teat body closed at one end and having an opening through its other end, the teat body entering the opening in the flange part and having its opening registering therewith;

a stopper having an axial channel therethrough, the stopper passing through the flange part and entering the teat body through its opening, with the channel in communication with the hollow teat body;

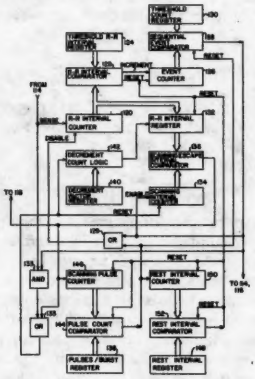
means for retaining the teat body and the flange part and the stopper mutually assembled; and

one-way valve means cooperatively associated with the channel through the stopper and operative to resist the passage of air outwardly from the hollow teat body through the channel but to freely admit air from the channel into the hollow teat body.

4,577,633
RATE SCANNING DEMAND PACEMAKER AND METHOD FOR TREATMENT OF TACHYCARDIA

Barouh V. Berkovits, Newton Highlands, Mass.; Menashe B. Waxman, Toronto, Canada, and William J. Combs, Shoreview, Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Mar. 28, 1984, Ser. No. 594,606
Int. Cl.[4] A61N *1/36*
U.S. Cl. 128—419 PG 29 Claims



1. The method of controlling a tachycardia condition comprising the steps of:

(a) sensing natural heart depolarizations and providing sense signals in response thereto;

(b) confirming a tachycardia condition;

(c) generating a burst of a plurality of spaced heart stimulating pulses which potentially allow tachycardia to be terminated;

(d) establishing escape intervals between each of said plurality of spaced heart stimulating pulses; and

(e) restarting an escape interval in the event that a sense signal is provided during an escape interval in response to a natural heart depolarization during the provision of said burst of heart stimulating pulses, whereby the provision of a stimulating pulse in the vulnerable phase of the heart cycle is avoided.

4,577,634
METHOD AND APPARATUS FOR ALLEVIATING PAROXYSMAL ATRAIL TACHYCARDIA

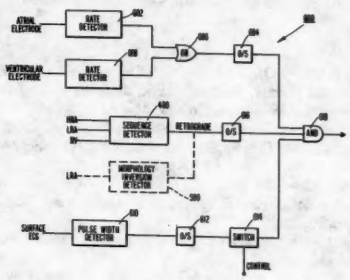
Lawrence J. Gessman, 1929 W. Point Ct., Cherry Hill, N.J. 08003

Division of Ser. No. 554,179, Nov. 22, 1983, Pat. No. 4,543,963. This application Jul. 2, 1985, Ser. No. 751,602
Int. Cl.[4] A61N *1/36*
U.S. Cl. 128—419 PG 8 Claims

1. A method for alleviating paroxysmal atrial tachycardia in a human heart, said method comprising the steps of:

a. detecting heart beat rates which exceed a predetermined level;

b. detecting the presence of retrograde P-waves; and

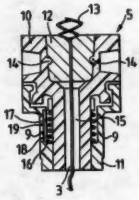


c. providing atrial pacing pulses in a predetermined format upon simultaneous occurrence of conditions detected in steps a and b.

4,577,635
MEDICAL INSTRUMENT

Hadyn G. Meredith, London, Great Britain, assignor to Rocket of London Limited, Watford, Great Britain

Filed Dec. 22, 1983, Ser. No. 564,164
Claims priority, application United Kingdom, Dec. 30, 1982, 8236922
Int. Cl.[4] A61B *5/04*
U.S. Cl. 128—642 4 Claims



1. An electrode assembly for fetal monitoring comprising:

a rotatable elongate drive member, said drive member having a forward end and a rear end;

a rotatable handle disposed on said rear end of said drive member for rotating said drive member;

an electrode holder, said electrode holder being mounted on said forward end of said drive member, said electrode holder having inner and outer relatively rotatable molded members, said outer molded member being connected to and rotatable with said drive member;

an electrically conductive electrode mounted on said inner molded member of said electrode holder, said electrode projecting from said inner molded member of said electrode holder and being rotatable with said inner molded member of said electrode holder;

means for electrically connecting the electrically conductive electrode to a monitoring device; and

a torque limiting means for limiting the amount of torque applied to said electrode by said drive member, said torque limiting means having a resiliently deformable member, said deformable member extending within an annular passage formed between said inner molded member and said outer molded member of said electrode holder, said deformable member being in frictional engagement with said inner molded member and held

against rotation relative to said outer molded member so that relative rotation of said deformable member between said molded members causes deformation of said deformable member to limit the extent of frictional engagement and prevent over rotation of said electrode.

4,577,636

METHOD FOR DIAGNOSIS OF ATHEROSCLEROSIS

J. Richard Spears, Boston, Mass., assignor to The Beth Israel Hospital Association, Boston, Mass.

Continuation-in-part of Ser. No. 443,958, Nov. 23, 1982, Pat. No. 4,512,762. This application Jan. 27, 1984, Ser. No. 574,682
Int. Cl.[4] A61B 6/00, 5/02
U.S. Cl. 128—654 10 Claims

1. A method for diagnosing atherosclerosis, said method comprising:

injecting a porphyrin solution into the blood vessels to be examined;

detecting the quantity of porphyrins absorbed by tissues in the blood vessels; and

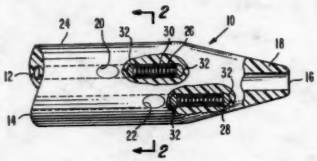
contrasting the quantity of porphyrins in different areas of the blood vessels to determine location, size, and quantity of athermatous plaques.

4,577,637

FLEXIBLE METAL RADIOPAQUE INDICATOR AND PLUGS FOR CATHETERS

Richard L. Mueller, Jr., Athens, Tex., assignor to Argon Medical Corp., Athens, Tex.

Filed Jul. 13, 1984, Ser. No. 630,570
Int. Cl.[4] A61M 25/00
U.S. Cl. 128—658 5 Claims



1. An improved multi-lumen catheter of the type comprising at least two lumens which extend from a proximal end to a distal end thereof of the type requiring at least one plugging device to terminate at least one of said lumens, wherein the improvement comprises:

at least one radiopaque lumen plug comprised of a coiled metal spring having rounded end caps attached to either end of said coiled spring, said rounded end caps having an outside diameter substantially equal to the inside diameter of the lumen in which said plug is inserted, whereby said lumen will be blocked by said plug and said plug will act as a radiopaque indicator.

4,577,638

ESOPHAGEAL STETHOSCOPE

John R. Graham, White Plains, N.Y., assignor to Biomedical Concepts, Inc., Elmsford, N.Y.

Division of Ser. No. 267,046, May 26, 1981, Pat. No. 4,484,583. This application Jun. 28, 1984, Ser. No. 625,811
Int. Cl.[4] A61B 5/02
U.S. Cl. 128—671 2 Claims

1. An esophageal stethoscope comprising a flexible plastic tube of a particular length and having a first bore extending over said length, said tube having a distal end for insertion in the esophagus of a patient and a proximal end opposite said distal end wherein said first bore audibly conducts breath and heart sounds produced in the vicinity of said distal end through said tube for monitoring at said proximal end, an audio transducer element mounted at said distal end of said tube for detecting the breath and heart sounds and providing output signals representative of the breath and heart sounds as produced only in the vicinity of said distal end, said audio transducer element being arranged in said tube so that said output signals are substantially unaffected by vibrations produced over the length of said tube outside the vicinity of said distal end, terminal means at the proximal end of said tube for providing said output signals for further processing, connecting means arranged in said tube and coupled to said audio transducer element for connecting said audio transducer element to

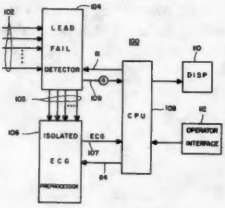
said terminal means, and fitting means communicating with said first bore of said tube at said proximal end for enabling the heart and breath sounds audibly conducted by said first bore to be monitored by a stethoscope earpiece and wherein said audio transducer element includes a thin membrane which vibrates in response to sound pressure corresponding to the breath and heart sounds and a light emitting diode means for providing a light beam to be modulated by said membrane, and said connecting means includes an optic fiber means extending over the length of said tube for conducting the modulated light beam from the distal end of said tube to said terminal means at the proximal end of said tube.

4,577,639

APPARATUS AND METHOD FOR AUTOMATIC LEAD SELECTION IN ELECTROCARDIOGRAPHY

Mark I. Simon, Chatsworth; Christopher G. Cotter, Van Nays, and Carolyn Stein-Gelinas, Agoura, all of Calif., assignors to Spacelabs, Inc., Chatsworth, Calif.

Filed Nov. 8, 1984, Ser. No. 669,290
Int. Cl.[4] A61B 5/04
U.S. Cl. 128—709 8 Claims



1. An ECG monitor comprising:

a plurality of ECG leads and associated electrodes for coupling said leads to a patient;

an ECG signal preprocessor coupled to said leads for combining the signals of said leads in accordance with selected ECG lead configurations chosen from a plurality of possible lead configurations to generate a combined ECG signal, said ECG signal preprocessor further comprising switching means for switching to said selected configurations of ECG leads in response to command signals;

means coupled to said ECG leads for identifying lead failures continuously during monitoring of said ECG signal; and

processor means for generating said command signals and coupled to said switching means for automatically switch-

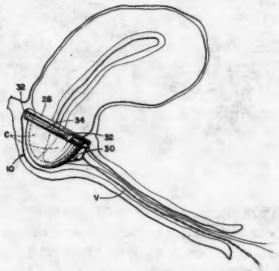
ing said leads to change said ECG lead configuration in response to the output of said identifying means.

4,577,640

METHOD AND APPARATUS FOR DIRECT IN VIVO MONITORING OF UTERINE ELECTRICAL ACTIVITY

John F. Hofmeister, 3860 E. Easter Pl., Littleton, Colo. 80122

Filed Mar. 20, 1984, Ser. No. 591,530
Int. Cl.[4] A61B 5/05
U.S. Cl. 128—738 15 Claims



1. For use in a system for charting the uterine electrical activity in the human female, an improved pick-up which comprises: a cervical cup made of an insulating material shaped and sized to closely fit the cervix upon insertion into the vagina, at least three low profile metal electrodes having broad smooth-surfaced heads exposed inside the cup for contacting the adjacent cervical tissue with an impedence between each electrode and the tissue of the cervix of less than about ten thousand ohms, said electrodes being arranged in a non-linear pattern effective to provide at least two unaligned current paths defined by selected pairs of electrodes for detecting and monitoring any electrical activity between said selected pairs of electrodes and producing a signal corresponding to such electrical activity, means connected to each of said electrodes for separately conducting said signals outside the body, and means connected to said electrodes for recording each of said signals separately from other signals.

4,577,641

METHOD OF FITTING HEARING PROSTHESIS TO A PATIENT HAVING IMPAIRED HEARING

Ingeborg J. Hochmair, and Erwin S. Hochmair, both of A-1130 Wien Jaunerstrafse 27, Vienna, Austria

Filed Jun. 29, 1983, Ser. No. 509,239
Int. Cl.[4] A61N 1/36; H04R 25/00
U.S. Cl. 128—746 16 Claims

1. A method of fitting a hearing prosthesis to a hearing impaired user comprising the steps of

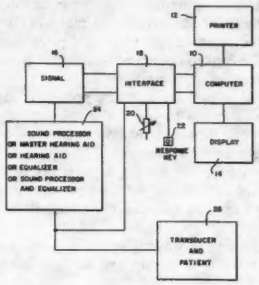
connecting said hearing prosthesis to the user,

applying a signal to said hearing prosthesis,

sweeping said signal in discrete frequency steps,

visually displaying said signal as transmitted by said hearing prosthesis for user observation as the frequency thereof is varied,

determining user response to said signal at each of said discrete frequency steps as the user observes the visual display, and



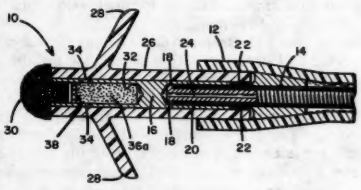
adjusting frequency response of said hearing prosthesis so that the user detects a desired response to said signal at each frequency step.

4,577,642

DRUG DISPENSING BODY IMPLANTABLE LEAD EMPLOYING MOLECULAR SIEVES AND METHODS OF FABRICATION

Kenneth B. Stokes, Minneapolis, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Feb. 27, 1985, Ser. No. 706,215
Int. Cl.[4] A61N 1/04
U.S. Cl. 128—784 9 Claims



1. A body implantable electrode lead, comprising:

an elongated insulative lead body having a proximal end and a distal end;

an electrical conductor mounted within said lead body, having a proximal end and a distal end;

an electrical connector mounted to the proximal end of said lead body and electrically coupled to said electrical conductor;

electrode means for contacting body tissue along an exterior surface of said electrode, said electrode mounted to said lead body and electrically coupled to the proximal end of said electrical conductor, said electrode having a cavity therein open to said exterior surface; and

dehydrated molecular sieve material mounted within said cavity.

4,577,643

MOVABLE MULTI-CONTACT ELECTROMECHANICAL CONNECTION

William J. Beranek, Cooper City, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed May 10, 1984, Ser. No. 608,785
Int. Cl.[4] A61N 1/04
U.S. Cl. 128—785 20 Claims

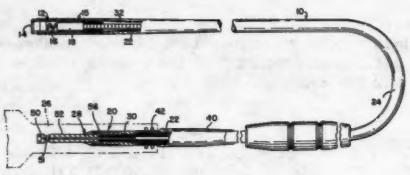
1. An improved cardiac pacer lead of the type having an

electrode at its distal end for attachment to and the transmittal of an electrical impulse to cardiac tissue, a terminal at its proximal end for insertion into a cardiac pulse generator adapted to generate an electrical impulse, and an insulating sleeve interconnecting the distal end to the proximal end containing means to transmit electrical current from said pulse generator to said electrode and means to rotate said electrode from said terminal end, the improvement comprising:

an elongated terminal pin at the proximal end of said lead having a generally cylindrical cross-section, said terminal pin extending into said insulating sleeve and engaging said electrode rotating means;

an elongated coupling having a generally cylindrical cross-section and defining an annular passage therewithin, said coupling engaging said current transmitting means at one end;

external retaining means including a collar member having an axial bore therewithin and further having a counterbore, both said bore and counterbore adapted to receive said terminal pin, said counterbore defining an annular cavity between said collar member and said terminal pin within said collar member, said terminal pin extending through said bore and counterbore and contained within said collar member, said terminal pin being capable of rotation within said collar member, said collar member engaging said coupling; and



a multi-contact electromechanical connection having a connector coil disposed within said collar member annular cavity, said connector coil being a mandrel-wound and tension-deformed length of springwire having a configuration wherein a plurality of individual coil turns are circumferentially offset from adjacent wound coil turns and project radially outwardly from the axis of said coil and springingly contact said collar member counterbore to create an electrical contact between said collar member and said terminal pin while allowing rotation of said terminal pin within said collar.

4,577,644

APPARATUS FOR TIP TURNING FILTER CIGARETTES OR THE LIKE

Karl-Heinz Grieben, Schwarzenbek, Fed. Rep. of Germany, assignor to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

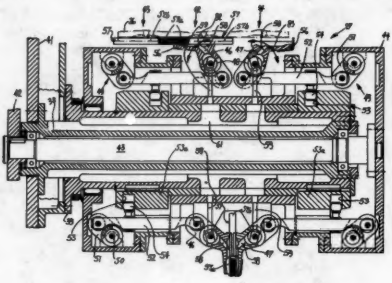
Filed Mar. 26, 1982, Ser. No. 362,409

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1981, 3114331

Int. Cl.⁴ A24F *5/32*

U.S. Cl. 131—94 **16 Claims**

1. Apparatus for inverting filter cigarettes or analogous rod-shaped articles each of which has a filter at one end thereof, comprising means for transporting two parallel rows of articles sideways along a first path so that the filters of articles in one of said rows are adjacent to the filters of articles in the other of said rows; means for turning the articles of said one row through at least substantially 180 degrees about axes which are at least substantially normal to the longitudinal directions of such articles and are remote from the respective filters so that the filters of the thus inverted articles face away from the articles of said other row, said turning means comprising at least one pair of holders each having article retaining means, means for moving said holders along a second path, and means for pivoting said holders relative to said moving means between first positions in which the receiving means of one of said holders is adjacent to the articles of one row in said first path and the other holder is remote from said first path, and second positions in which the article receiving means of said holders are adjacent to each other so that the receiving means of said one holder can accept an article of said one row from



said first path in the first position of said one holder and such article can be transferred into the receiving means of said other holder in the second positions of said holders for pivotal movement with said other holder during pivoting of the latter to said first position thereof; and means for shuffling the articles of said rows to form a single third row of articles wherein the orientation of all filters is the same.

4,577,645

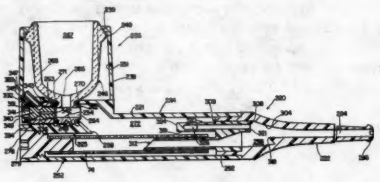
REDUCED MOISTURE SMOKER'S PIPE

Edward H. Calkins, 333 E. Main St., Gaylord, Mich. 49735

Continuation-in-part of Ser. No. 213,725, Dec. 5, 1980, Pat. No. 4,362,169. This application Dec. 16, 1981, Ser. No. 331,316

Int. Cl.⁴ A24F *5/00, 5/04, 7/02*

U.S. Cl. 131—196 **25 Claims**



1. A smoker's pipe comprising:

a hollow stem having an enlarged cooling chamber therein;

a mouthpiece having a longitudinal bore therein and mounted on the rearward end of said stem; and

a bowl assembly mounted on the forward upper portion of said stem, said bowl assembly comprising

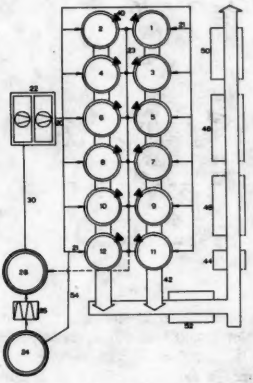
a combustion bowl having walls which define an interior combustion chamber, the interior surface of said walls converging about a centrally located, axial bore, said bowl also having a passageway longitudinally extending completely through the bottom portion thereof below said combustion chamber and in communication with said axial bore and with said stem cooling chamber, the effective length of said longitudinal passageway being short with respect to the width of said combustion chamber and the diameter of said longitudinal passageway being smaller than the diameter of said stem cooling chamber.

4,577,646

PROCESS FOR IMPROVING THE FILLABILITY OF TOBACCO

Klaus-Dieter Ziehn, Pinneberg, Fed. Rep. of Germany, assignor to H.F. & Ph.F Reemtsma GmbH & Co., Hamburg, Fed. Rep. of Germany

Filed Apr. 20, 1984, Ser. No. 602,425
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1983, 3314474
Int. Cl.[4] A24B *3/18*
U.S. Cl. 131—296 18 Claims



1. In a process for improving the fillability of tobacco by treatment with a treatment gas containing at least one of the following: nitrogen gas, argon gas or a mixture thereof at pressures up to 1000 bar in an autoclave, decompressing the tobacco, and subjecting the tobacco to a heat treatment, the improvement comprising:

supplying the autoclave with both tobacco and treatment gas and decompressing the treated tobacco in such manner that the decompressed tobacco supplied to the subsequent heat treatment has an inlet temperature for the heat treatment of below 0° C., said treatment gas being non-polar.

4,577,647

HAIR CURLER DEVICE

Larry A. Fenster, Roslyn, N.Y., and Fritz Hostettler, Freehold, N.J., assignors to Mercury Foam Corporation, South Hackensack, N.J.

Filed Nov. 1, 1984, Ser. No. 667,330
Int. Cl.[4] A45D *2/02*
U.S. Cl. 132—39 7 Claims

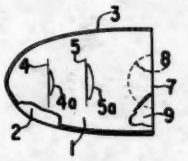
1. A hair curler device having an outer skin of predetermined frictional characteristics, a resilient foam sheath of a foamed material and a bendable core element having anchoring means for binding the same to the resilient foam sheath, wherein the anchoring means consist of adhesive securement or transversely positioned elements disposed within and transversely to the longitudinal axis of said hair curler device and embedded in said hair curler foam sheath.

4,577,648

FINGERNAIL SHIELDING DEVICE

Frances Dinerstein, 100 W. 57th St., New York, N.Y. 10019, and Lia Dinerstein, 30 E. 9th St., New York, N.Y. 10003

Filed Dec. 19, 1979, Ser. No. 105,256
Int. Cl.[4] A45D *29/00*
U.S. Cl. 132—73 4 Claims



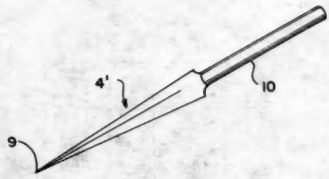
1. A non-adhesive containing nail shielding device for use in applying a formaldehyde-containing liquid nail-hardening composition to human nails while protecting the cuticle and surrounding soft skin tissue from contact with said liquid composition, said shielding device consisting of an integral device having (i) a top surface comprising a forward end which is placed under the white tip of the nail, side portions which cover skin adjacent to side edges of the nail, a rear portion to cover the cuticle and skin to the rear of the cuticle, and two transverse apertures between the forward and rearward edges, the transverse aperture closer to the forward edge being smaller than the other transverse aperture, and (ii) a bottom surface which covers the bottom portion of the finger, the bottom surface and the top surface being joined on their forward and lateral edges and having a rearward opening into which the finger is inserted.

4,577,649

TOOTHPICK

Marat Shimenkov, 65-46 Parson Blvd., #2A, Flushing, N.Y. 11365

Filed May 1, 1980, Ser. No. 145,690
Int. Cl.[4] A61C *15/00*
U.S. Cl. 132—93 10 Claims



1. A toothpick, comprising

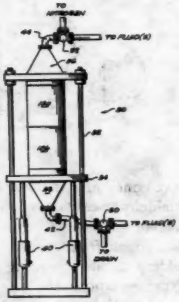
an elongated trihedral hollow body having two side walls forming two straight faces extending in direction of elongation and inclined relative to one another so as to form an acute angle therebetween, said body also having a third wall which connects said first-mentioned side walls with one another and defines a third face which is concave so as to form two lower edges which are substantially sharp, said body being elastic in direction transverse to the direction of elongation so as to be compressed during insertion of the toothpick between teeth whereby said straight side faces act upon the teeth, and said third wall being upwardly convex so as to elastically urge said side walls in the transverse direction away from one another and thereby against the teeth.

4,577,650

VESSEL AND SYSTEM FOR TREATING WAFERS WITH FLUIDS

Christopher F. McConnell, 978 S. Gulph Rd., Gulph Mills, Pa. 19406

Filed May 21, 1984, Ser. No. 612,355
Int. Cl.[4] B08B *3/04*
U.S. Cl. 134—59 34 Claims



1. A vessel for treating semiconductor wafers by passing a fluid about said wafers after said vessel has been loaded and incorporated within a fluid flow line, said vessel comprising:

lateral walls adapted to enclose therebetween a plurality of wafers and defining open ends;

means integral with said walls for supporting the wafers within said walls;

first sealing means which, in operation, is integral with one of said open ends for sealingly engaging means communicating with a fluid inlet; and

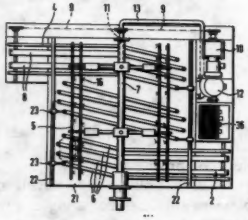
second sealing means about the other open end for sealingly engaging means communicating with a fluid outlet.

4,577,651

DEVICE FOR CLEANING CONTAINERS

Robert Mürtz, Neuwiederstrasse 12, 5470 Andernach 12, Fed. Rep. of Germany

Filed Apr. 19, 1984, Ser. No. 601,800
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1983, 3315413
Int. Cl.[4] B08B *3/02*
U.S. Cl. 134—111 8 Claims



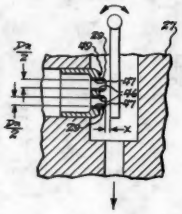
1. Apparatus for cleaning bottle-shaped containers, comprising: container intake means; helical guide means located in a path after said intake means for guiding said containers along a path of travel; at least one container carrier positioned within said helical guide means and having integrated spray nozzles for cleaning agent; and container outtake means downstream of said helical guide means, said container carrier being rotatable and extending transverse through the inside of said helical guide means, said container carrier being free of separate container receptacles; an input of said container intake means having a pneumatically controlled stop for synchronizing operations; stationary cleaning-agent spray nozzles outside of said helical guide means and aimed inward; said helical guide means comprising four parallel helical tubes with two outer helical tubes positioning side walls of the containers, said two outer helical tubes being higher than two inner helical tubes supporting bottoms of the containers.

4,577,652

NOZZLE AND IMPINGEMENT PLATE VALVE

John R. Blatner, Amherst, N.Y., assignor to Hydraulic Servo-controls Corporation, Buffalo, N.Y.

Filed Mar. 8, 1984, Ser. No. 587,607
Int. Cl.[4] G05D *16/00*
U.S. Cl. 137—82 5 Claims



1. A servovalve comprising a housing, a fluid inlet in said housing, a fluid outlet in said housing, a plurality of nozzles in communication with said fluid inlet, a flapper, an armature mounting said flapper in cantilevered fashion and in contiguous relationship to said plurality of nozzles, a gap between said plurality of nozzles and said flapper, said gap having a dimension which is quite small in relation to the diameter of each of said nozzles so that the fluid metering area is the product of the flow periphery which is the sum of the peripheries of each of said nozzles times the dimension of said gap, moving means in said servovalve for moving said armature to effect relative positioning between said plurality of nozzles and said flapper, said armature requiring an actuating force from said moving means to effect relative positioning between said flapper and said plurality of nozzles which is the product of the pressure drop across said gap times the projected area of said plurality of nozzles on said flapper, said plurality of nozzles having a smaller projected area than that of a single cylindrical nozzle of equivalent periphery, whereby said moving means which is used to cause said armature to effect relative movement between said plurality of nozzles and said flapper may produce a smaller force output than that of moving means which is used to effect relative movement between a flapper and said single cylindrical nozzle.

4,577,653

ANTI-SIPHON AND ANTI-KNOCK DIVERTER VALVE

Garry R. Marty, Holly, Mich., assignor to Masco Corporation, Taylor, Mich.

Filed Jun. 30, 1983, Ser. No. 509,302
Int. Cl.[4] F16K *11/02*
U.S. Cl. 137—119 12 Claims

1. A diverter valve assembly characterized by:

a housing having an inlet, a first outlet and a second outlet;

said housing comprising a first member and a second member snap-fitted to said first member;

said second member including said inlet and said second outlet;

said first member includes said first outlet;

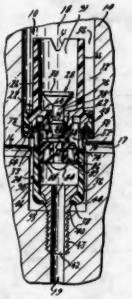
a valve element mounted in said first section movable between a closed position and an open position with respect to said first outlet;

a piston means for moving said valve element and positioned

in said second section with said piston means being responsive to pressure differential between said second outlet and said inlet for movement to a first and second position such that when a lower pressure exists at said second outlet, said piston means moves to said second position and moves said valve element to said closed position;

means for passing fluid from said inlet to said second outlet by said piston means;

said housing positionable in a body defining a valve chamber having a first body outlet, a second body outlet; and a



body inlet; said housing seated in said chamber; said valve chamber being open to said inlet or said outlets through said body and capable of being totally filled with fluid flowing from said inlet to both outlets; said second section includes an end section fixedly engageable to said second body outlet; said end section has a longitudinal aperture therethrough defining said second outlet; and

sealing means associated with said housing for sealing said body inlet from said body outlets such that fluid flowing from said body inlet, through said chamber and to said body outlets flows through said housing.

4,577,654

FLUID ACTUATED PIPELINE VALVE

Ronald E. Pringle, Houston, Tex., assignor to Cameo, Incorporated, Houston, Tex.

Filed Jun. 10, 1985, Ser. No. 742,683

Int. Cl.[4] F16K *31/124*

U.S. Cl. 137—219 **1 Claim**

1. A pipeline valve comprising,

a vertically positioned body,

a valve seat positioned coaxially in the body in a horizontal plane,

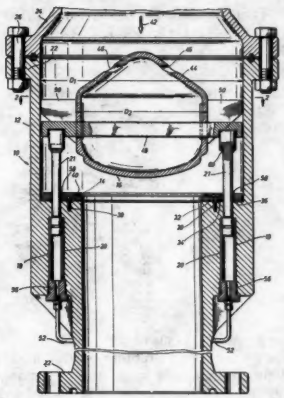
a valve element positioned upstream of said seat and axially movable in the body for movement towards and away from the valve seat whereby the weight of the valve element acts to move the valve element towards the seat,

the cross-sectional area of the valve element being substantially less than the cross-sectional area of the body thereby reducing the restriction of flow through the body by the valve element when the valve is opened,

first and second hydraulic piston and cylinder assemblies positioned in the body and connected between the valve element and the valve body for moving the valve element away from the valve seat, said first and second assemblies being diametrically opposed to each other and parallel to the longitudinal axis of the body,

sealing valve and seat means positioned upstream of said valve seat about each piston and cylinder assembly and adapted to close and seal off said assemblies when the valve is closed,

said piston and cylinder assemblies being in communication with the exterior of the body at a location downstream of the valve seat for repairing the assemblies when the valve is closed, and



guide means between the valve element and the body for axially guiding the valve element in the body.

4,577,655

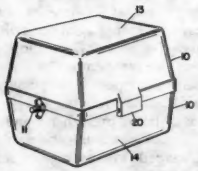
APPARATUS FOR INSULATING WATER FAUCETS

James M. Carroll, Sowell Rd., Madison, Miss. 39110

Filed Jun. 22, 1984, Ser. No. 623,500

Int. Cl.[4] F16K *51/00*

U.S. Cl. 137—375 **2 Claims**



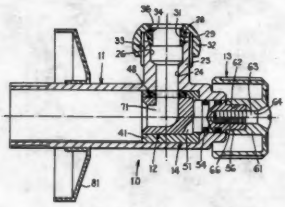
1. An apparatus for protecting faucets comprising a cover, a rigid foam insulator enclosed in said cover, a threaded hook member for holding said cover firmly to the faucet or the like, a rubber foam end seal mounted on said cover, said cover being formed of two halves with each of said halves being formed in the horizontal plane together forming an upper and lower part of said cover, said rigid foam insulator being enclosed in each of said halves of said cover, said rubber foam end seal being mounted separately on each of said halves of said cover, said cover halves each having a partial hole therein on the front of each of said cover halves so that engagement of said cover halves to each other forms said cover having a hole therein on its front through which said threaded hook member passes, said threaded hook member attaching to the faucet by passing through said cover front and said enclosed insulator being formed having a central cavity therein for insertion of said faucet into said cavity.

4,577,656

VALVE

Jose M. F. Beltran, No. 10 - 12 Doctor Fleming Street, Boarepos (Valencia), Spain

Filed Jun. 13, 1984, Ser. No. 620,199
Int. Cl.[4] F16L 7/00
U.S. Cl. 137—375 4 Claims



1. A valve assembly, comprising:

a valve body comprising a tubular portion having an interior wall defining therein a main supply passage extending coaxially thereof, said tubular portion having an inlet opening associated with one end thereof for communication with said supply passage, and means associated with said tubular portion adjacent the other end thereof for defining an outlet opening adapted for communication with said supply passage, said outlet opening extending through the sidewall of said tubular portion in substantially transverse relationship with respect to the longitudinal axis of said supply passage;

valve means rotatably disposed within said tubular portion adjacent said other end thereof and movable between open and closed positions for controlling flow of fluid from said main supply passage to said outlet opening;

a socketlike sleeve member snugly seated within said main supply passage adjacent said other end of said tubular portion, said socketlike sleeve member being nonrotatably coupled to said tubular portion and defining therein a central opening which is coaxially aligned with and communicating with said main supply passage, said sleeve member also having a communication opening formed radially through the sidewall thereof and disposed in axial alignment with said outlet opening, said communication opening being of larger diameter than said outlet opening;

said valve means including a substantially cylindrical valve member snugly but rotatably positioned within the central opening of said sleeve member, said valve member having a substantially L-shaped flow passage extending therethrough, said L-shaped flow passage including an inlet which opens axially through an end face of said valve member for direct communication with main supply passage, said L-shaped flow passage including an outlet at its other end which is formed in the surrounding exterior cylindrical sidewall of said valve member, said outlet being of smaller diameter than said communication openng, and said outlet being radially aligned with the communication opening in said socketlike sleeve member when the valve member is rotatably moved onto its open position;

an elastomeric seal ring positioned within and extending around the radially outer portion of said communication opening and being compressively held between the interior wall of the tubular portion and the exterior cylindrical side wall of the rotary valve member for creating a first annular sealed arrangement with the interior wall of the tubular portion in surrounding relationship to the outlet opening and a second annular sealed engagement with the exterior cylindrical sidewall of said valve member, said seal ring sealingly engaging the exterior cylindrical sidewall in surrounding relationship to said outlet when said valve member is in its open position; and

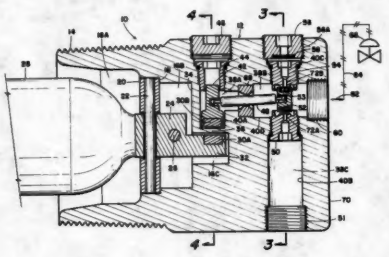
handle means positioned externally of said tubular portion adjacent said other end thereof and coaxially aligned with and nonrotatably fixed to said valve member for controlling rotation thereof between said open and closed positions.

4,577,657

MAGNETIC-PNEUMATIC LIQUID LEVEL CONTROL

Jack L. Alexander, P.O. Box 1016, Tulsa, Okla. 74101

Filed Mar. 12, 1984, Ser. No. 589,177
Int. Cl.[4] F16K 31/08, 31/18, 33/00
U.S. Cl. 137—448 3 Claims



1. A liquid level control means comprising:

(a) body means adapted to be inserted and sealed into the wall of a chamber containing a liquid to be controlled to a selected level; said body having a first end and a second end, each having a cavity of selected size and shape, with a wall sealing between the first cavity in the first end and the second cavity in the second end; said body being positioned in elevation relative to the selected liquid level;

(b) arm means pivotally supported in said first cavity; said arm means having a float on one end and a first magnet on the other end being disposed in a portion of said first cavity, said first magnet positioned to move in a plane that is parallel to the pivotal movement of said float;

(c) reciprocating magnet holder means positioned in a bore of said second cavity defined by the first cavity and the first cavity portion so as to be guided to move perpendicular to said plane of said first magnet; said holder having a second magnet in its end, facing said first magnet with said wall between said first and second magnets; said magnets arranged to attract each other, or to repel each other depending on the position of said float and said first arm;

(d) pivoted shuttle rod means positioned with a first end controlled by the position of said magnet holder; the second end of said pivoted shuttle rod having means to control said selected liquid level.

4,577,658

CALIBRATED FLUID FLOW CONTROL DEVICE

Michel Bosteels, 157 Avenue Haras, B 1150 Bruxelles, Belgium, and Ambro Oliva, 180 Boulevard de Montmorency, 95170 Deuil la Barre, France

Filed Jun. 29, 1984, Ser. No. 626,322
Claims priority, application France, Jun. 30, 1983, 83 10922
Int. Cl.[4] F16K 31/08; H01H 47/00
U.S. Cl. 137—599 2 Claims

1. A device for calibrated flow control of at least one fluid, comprising a plurality of bistable electrovalves of the on-off type mounted on a single body having therein a plurality of recesses containing a plurality of seats for a plurality of valves and a plurality of calibrated nozzles, each of which determines a given flow, and at least one fluid inlet pipe and one fluid outlet pipe leading, respectively, upstream of said seats and downstream of said nozzles in said recesses,

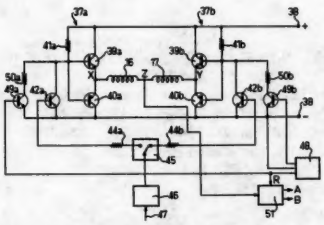
the improvement wherein the bistable electrovalves comprise

permanent magnetic means for maintaining each said valve in each of its two positions and,

for each valve, electromagnetic means for moving each said valve from each of its positions to its other position,

the permanent magnetic means comprising two fixed permanent magnets and, for each valve, a moving magnetic core integral with the valve,

the electromagnetic means comprising, for each valve, two coils which may be fed in both directions and are disposed in such a way that when the two coils are fed in one direction, the field of one coil reinforces the action exerted by the field of one magnet on the core, while the field of



the other coil reduces or cancels the action exerted by the field of the other magnet on the core, and inversely,

the two coils of each valve being fed in one direction and in the other by a continuous polarity power supply passing through a pulse-controlled circuit, the two coils being mounted in series,

valve position detecting means for each valve comprising a frequency generator feeding the two coils at their extremities and a synchronous detector with a reference input connected to one of the outputs of the frequency generator, and a detection input connected to the junction of the coils for determining the position of the moving core on the base of impedance variations affecting the coils according to the position of the moving core.

4,577,659

COUPLING ARRANGEMENT FOR PIPE CONDUITS CONDUCTING A MEDIUM CONTAINING RADIOACTIVE SUBSTANCES

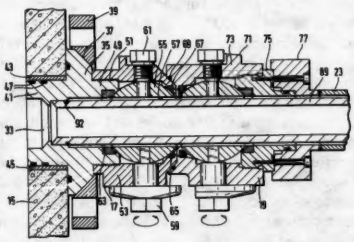
Hans-Dieter Gembus, Pattensen, and Rainer Wolf, Weingarten, both of Fed. Rep. of Germany, assignors to Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH, Hanover, Fed. Rep. of Germany

Filed Oct. 22, 1984, Ser. No. 663,383

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1983, 3338241

Int. Cl.[4] F16L *37/28, 27/12*

U.S. Cl. 137—614.06 **8 Claims**



1. A coupling arrangement for joining two pipe conduits to each other for conducting a medium containing toxic or radioactive materials therethrough, the arrangement comprising:

a first coupling unit mounted on the end of a first one of the pipe conduits;

a conduit engaging assembly mounted at the end of the second one of said pipe conduits, said conduit engaging assembly including:

an inner conduit segment tightly connected to and aligned with said second pipe conduit;

a tubular member arranged in surrounding relationship to said inner conduit segment so as to be coaxial therewith, said tubular member having a forward free end facing toward said first coupling unit; and,

a second coupling unit mounted on said forward free end of said tubular member and being joinable to said first coupling unit;

each of said coupling units including valve means movable between a first position for blocking the flow of the medium and a second position for defining a clear through bore communicating with said first and second pipe conduits when said coupling units are joined together; and,

said conduit engaging assembly further including displacing means for displacing said tubular member and said inner conduit segment relative to each other so as to permit said inner conduit segment to penetrate and pass through said bores thereby establishing a clear through connection between said first and second pipe conduits to allow the passage of the medium from one of said pipe conduits to the other one of said pipe conduits.

4,577,660

ROTARY SERVOVALVE

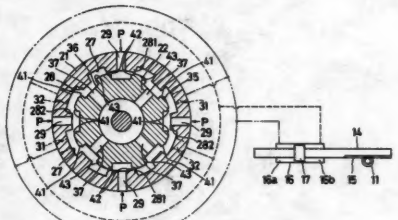
Kyosuke Haga, Anjoh, and Tsuneo Tanaka, Okazaki, both of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Jul. 2, 1984, Ser. No. 627,097

Claims priority, application Japan, Jul. 4, 1983, 58-121410

Int. Cl.[4] F15B *9/10;* **F62D** *5/083;* **F16K** *11/083*

U.S. Cl. 137—625.24 **8 Claims**



1. A rotary servovalve comprising:

(a) a valve sleeve having a plurality of sleeve lands on an inner peripheral surface;

(b) a rotor having a plurality of rotor lands on an outer peripheral surface and relatively rotatably fitted in said valve sleeve;

(c) first and second fluid supply inlets opening into a space between said valve sleeve and said rotor;

(d) a plurality of fluid discharge outlets opening in said space;

(e) a pressure control section composed of selected ones of said sleeve lands and said rotor lands, said selected sleeve and rotor lands being angularly spaceable from each other when the rotary servovalve is in a neutral condition to allow communication between said first fluid supply inlet and at least a first one of said fluid discharge outlets;

(f) a pressure characteristic adjusting section composed of other selected ones of said sleeve lands and said rotor

lands, said other selected sleeve and rotor lands being positionable in overlapping relation to each other when the rotary servovalve is in the neutral condition to prevent communication between said second fluid supply inlet and said at least a first one of said fluid discharge outlets;

(g) first chamfers formed on at least one of the sleeve and rotor lands constituting said pressure control section, said first chamfers comprising means for gradually reducing the area of communication between said first fluid supply inlet and said first one of said fluid discharge outlets when said valve sleeve and said rotor are relatively rotated;

(h) second chamfers formed on at least one of the sleeve and rotor lands constituting said pressure characteristic adjusting section, said second chamfers comprising means for gradually increasing the area of communication between said second fluid supply inlet and said first one of said fluid discharge outlets when said valve sleeve and said rotor are relatively rotated; and

(i) third chamfers formed on at least one of the sleeve and rotor lands constituting said pressure characteristic adjusting section, said third chamfers comprising means for gradually reducing the area of communication between said second fluid supply inlet and said first one of said fluid discharge outlets, with a delay from the action of said second chamfers, when said valve sleeve and said rotor are relatively rotated.

4,577,661

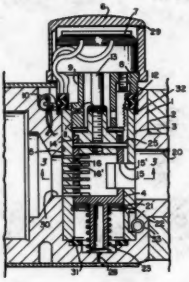
HIGH SPEED-HIGH FLOW SPOOL VALVE

David R. Melrose, Ringoes, and Mario A. Russo, Edison, both of N.J., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Continuation of Ser. No. 624,790, Jun. 25, 1984, abandoned, which is a continuation of Ser. No. 330,226, Dec. 14, 1981, abandoned. This application Mar. 25, 1985, Ser. No. 715,766

Int. Cl.[4] F16K *3/26, 31/06*

U.S. Cl. 137—625.33 **3 Claims**



1. A valve for interrupting flow of pressurized fluid comprising:

a cylindrical body having a central cylindrical bore extending along an axis with an inlet opening on one side of the body for receiving pressurized fluid and an outlet opening on an opposing side of the body for discharging pressurized fluid;

a cylindrical sleeve disposed within said central bore having a sleeve opening adjacent to said inlet opening and having sleeve slots generally perpendicular to said axis across said outlet opening;

a valve spool disposed within said cylindrical sleeve and movable along said axis within said cylindrical sleeve to a first and second position, said spool having a spool opening having substantially the same cross-sectional area as said sleeve opening and positioned adjacent said sleeve opening and having spool slots generally perpendicular to said axis communicating with said spool opening and positioned adjacent said slots in said sleeve to form a grill-like structure with said slots in said sleeve, said spool slots and sleeve slots having a size selected so that in said one position of said valve spool the slots close the grill-like structure and in said second position of said valve spool said slots open the grill-like structure; and

a solenoid operator connected to move said valve spool to said first and second position.

4,577,662

PLUG VALVE EQUIPPED WITH PRESSURE EQUALIZATION MEANS

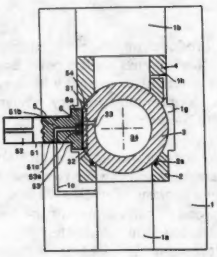
Bernard Doremus, Echouboulains, France, assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Jan. 26, 1984, Ser. No. 574,237

Claims priority, application France, Jan. 28, 1983, 83 01725

Int. Cl.[4] F16K *5/06, 39/00*

U.S. Cl. 137—630.14 **4 Claims**



1. A plug valve comprising:

a valve body having a fluid flow passage therein;

a ball element having an outer surface and a bore therethrough, said ball element being sealingly received within said valve body for rotation from a valve-closed position in which fluid flow between upstream and downstream portions of said flow passage is blocked to a valve-open position in which said fluid flow is permitted;

displacement means for rotating said ball element sealingly crossing through said valve body and having a pin, the longitudinal axis of which is substantially perpendicular to said bore; and

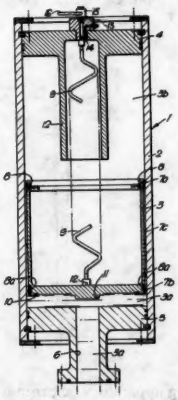
means for equalizing pressure between said upstream and downstream portions of said flow passage prior to movement of said ball element from said valve-closed to said valve-open positions, including means communicating pressure between said bore of said ball element and one of said upstream and downstream portions of said flow passage, at least one lateral channel within said ball element connecting said bore with said outer surface, at least one passageway formed within said pin, and a bypass channel formed within said valve body; said lateral channel, passageway and bypass channel being arranged to establish pressure communication between said bore and the other of said upstream and downstream portions of said flow passage when said pin is turned by a given angle from an extreme position to bring said lateral channel, said passageway and said bypass channel into alignment; and said displacement means acting on said ball element to open said valve only after said pin has turned by said angle.

4,577,663

FLUID ACCUMULATOR

Per B. Andersen, Åneby, Norway, and Ole J. Richter, Karlstad, Sweden, assignors to Myrens Verksted A/S, Oslo, Norway

Filed May 31, 1984, Ser. No. 615,794
Claims priority, application Norway, Jun. 6, 1983, 832042
Int. Cl.[4] F16L 55/04
U.S. Cl. 138—31 8 Claims



1. In a fluid accumulator, for use in a hydraulic system which receives and delivers large quantities of working fluid during a short period of time, including a cylinder having end walls, a piston slidably operable in the cylinder between the end walls, a compressible fluid acting on one side of the piston in the cylinder, and a liquid port in the cylinder through which liquid flows into and out of the cylinder to act on the opposite side of the piston so that when the liquid pressure is higher than the pressure of the compressible fluid it moves the piston to compress the compressible fluid so that more liquid can be stored in the cylinder and when the pressure of the liquid is lower than the pressure of the compressible fluid, the compressible fluid moves the piston to force the liquid out of the cylinder, the improvement comprising:

a cup-shaped piston having a base portion and a relatively long axial extending cylindrical wall portion with the opening thereof facing towards the end of the cylinder containing the compressible fluid;

said wall portion being relatively thin compared to the base portion and having an outer dimension less than the dimension of the inner surface of the cylinder to provide a space therebetween the full length of said wall portion;

sliding support rings mounted in axially spaced relationship on the outer surface of said wall portion having an outer dimension less than the inner dimension of the surface of the cylinder so that said piston floats freely between said liquid and compressible fluid ends in the cylinder;

a stroke limiting extension projecting from the end wall at the compressible fluid end of the cylinder toward said piston having a length so that the end remote from the cylinder end engages said base portion of the piston when said piston is in its limit of travel toward the compressible fluid end with the end of said wall portion of the piston abutting said compressible fluid end of the cylinder; and

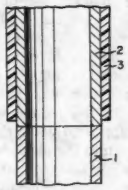
a sealing ring on the liquid side of the piston around said liquid port which abuts against the liquid end of the cylinder when the piston is in its limit of travel toward the liquid end of the cylinder.

4,577,664

CONDUIT TUBE OF AN ELECTRODE DEVICE FOR ELECTRICALLY HEATING UNDERGROUND HYDROCARBON RESOURCES

Ichiro Takahashi, Suita; Goro Okamoto, Itami, and Kazuo Okahashi, Toyonaka, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 17, 1984, Ser. No. 601,278
Int. Cl.[4] F16L 9/14; B65H 81/00
U.S. Cl. 138—149 8 Claims



1. An improved electrically insulating covering for conduit tubes used for encasing electrode devices which are used in the extraction of oil from oil sand wherein said conduit tubes have a metal conduit tube and an electrically insulating covering adhered to said outer peripheral surface of said metal conduit tube wherein said improved electrically insulating covering comprises:

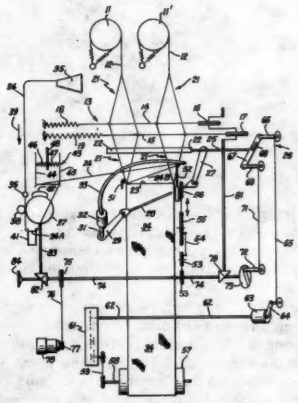
a powdered polyether/ether/ketone resin having a particle size of the range of from 10 to 100 μm which has been placed in contact with said metal conduit tube by way of electrostatic coating said metal conduit tube and wherein said powdered polyether/ether/ketone adhered to said metal conduit tube, by way of fusionbonding, in a temperature range of from 350° C. to 450° C. to and wherein said metal conduit tube has been preheated prior to the adherance of said polyether/ether/ketone to a temperature range of from 350° C. to 450° C.

4,577,665

NARROW-FABRIC NEEDLE LOOM WEAVING SYSTEM

Willi Diesner, Wuppertal, Fed. Rep. of Germany, assignor to Petig Corporation, Pittsfield, N.H.

Filed Oct. 7, 1983, Ser. No. 539,966
Int. Cl.[4] D03D 47/42
U.S. Cl. 139—431 53 Claims



1. In an improved needle loom machine for narrow width weaving comprising means for supplying warp thread, means

for supplying weft thread, a header sub-assembly for maintaining the warp thread spread in a predesigned pattern and forming a shed, a reciprocally movable needle for insertion of the weft thread into the shed during each successive pick, a needle-like pick for picking off a predetermined length of weft thread from the needle during each successive insertion of the needle in the shed at the far end of the travel thereof, a reed assembly for beating-up the warp and weft threads to form the fell of the fabric at a beat-up region at the output end of the shed during each pick, and a take-up roll for withdrawing the woven material after it is beaten up in the beat-up region; the improvement comprising means for automatically feeding weft thread to the needle during reciprocal movement thereof while weaving, a hook supported on the machine on the side of the shed into which the needle enters at the near end of the travel thereof during each reciprocation, the hook having an open jaw hooked end facing the fell around which the bend in a weft thread segment is supported while the needle is at the far end of the travel thereof into the shed during each reciprocation, the end of the open jaw hooked end of the hook being terminated immediately adjacent the beat-up region where the fell is formed as close thereto as possible whereby as the reed drives home the weft thread segment during beat-up, the bend in the weft thread segment is maintained straight by the hook and is forced off the open jaw hooked end at the end of the beat-up into the fell to form a straight line selvage for the woven material, and a leader guide member mounted immediately adjacent the hook on the side thereof away from the shed and beat-up region for engaging and guiding weft thread segment into the open jaw hooked portion of the hook while the needle is withdrawn from the shed during each reciprocation thereof.

4,577,666

WEFT YARN TENSIONING DEVICE

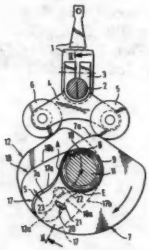
Josef Kathriner, Kollbrunn, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Apr. 18, 1984, Ser. No. 601,701

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1983, 3315433

Int. Cl.⁴ D03D *47/34*

U.S. Cl. 139—450 **8 Claims**



1. A weft yarn tensioning device for a weaving machine comprising

a tensioning lever for movement between a yarn-tensioning position and a yarn-releasing position;

a cam follower lever mounting said tensioning lever thereon;

a pair of follower rolls rotatably mounted on said follower lever;

a pair of cams, each said cam having a control surface for guiding a respective roll thereon; and

at least one adjusting element between said cams for controlling a movement of said tensioning lever, said element having a pair of cam segments, each said cam segment having a control surface defining a continuation of said control surface of a respective cam whereby movement of said adjusting element adjusts said pair of cam segments simultaneously relative to said pair of cams to vary said movement of said tensioning lever from one of said positions.

4,577,667

LOG SPLITTING DEVICE

Kevin Gray, Manti, Utah, and Frederic A. Johnson, 235 E. 100 North, Manti, Utah 84642, assignors to Frederic A. Johnson, Manti, Utah

Filed Sep. 13, 1984, Ser. No. 650,098

Int. Cl.⁴ B27L *7/00*

U.S. Cl. 144—193 C **5 Claims**

1. A log splitting apparatus comprising:

an elongated driving shaft having top and bottom ends;

a wedge-shaped slitting tip attached to the bottom end of the shaft,

an elongated driver sleeve formed by an enclosing sleeve wall slidably mounted around an upper part of the driving shaft and having an open bottom end and a closed top end, and having a lengvth less that that of the shaft, said top end comprising a driver cap adapted for impact at the top end of the driving shaft;

said driver sleeve further including catch means coupled through the sleeve wall and operable with respect to the driving shaft for providing releasable engagement at an enclosed portion of the upper end of the driving shaft and being operable to lock the driving shaft in a fixed position when the catch means is depressed by a user and the shaft is in a substantially recessed position within the sleeve, said catch means including means for biasing to a nonengaging position to allow the driving shaft to freely move within the driving encasement except when the catch means is depressed to thereby retain the shaft in a fixed position.

4,577,668

VEHICLE WHEEL

Hans Seitz; Henner Pieper; Udo Frerichs, all of Langenhagen, and Heinz-Dieter Rach, Garbsen, all of Fed. Rep. of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Aug. 16, 1983, Ser. No. 523,695

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1982, 3231012

Int. Cl.⁴ B60C *17/00, 15/02*

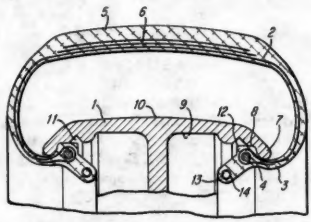
U.S. Cl. 152—520 **12 Claims**

1. A vehicle wheel in combination with a belted pneumatic tire having two beads and a pull-resistant core in each bead; comprising:

a rigid one-piece rim with two essentially radially inwardly extending rim flanges; adjacent each rim flange and on the radially inner surface of said rim, the latter is provided with a respective seat, one for each of said tire beads; said rim also being provided on said radially inner surface with two recessed portions respectively disposed between one

of said seats and a central plane of said rim, with the base of each of said recessed portions being disposed on a diameter of said rim which is greater than the average diameter of said rim on which said seats are disposed; the radially outer surface of said rim being provided with a circumferential supporting surface for the radially inner surface of said tire; and

means which are provided on at least one of said rim and said



tire beads, and which, at least in the region of that part of said tire being supported on a driving surface at any given time, effect a disengagement of said tire beads from said seats when said tire experiences a loss of air pressure, and also prevent an only periodic return of said tire beads to said seats while said tire is being driven after having experienced said loss of air, with said supporting surface of said rim riding on said radially inner surface of said tire during such an emergency operation.

4,577,669

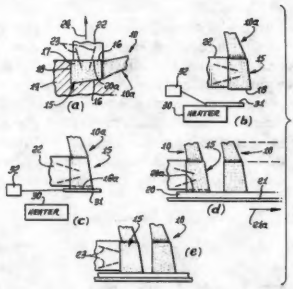
FABRICATION OF GOLF CLUB HEADS

Glenn H. Schmidt, 1857 Los Encinos, Glendale, Calif. 91208, and Howard F. Schmidt, S. Gate, Calif., assignors to Glenn H. Schmidt, Glendale, Calif.

Continuation-in-part of Ser. No. 406,337, Aug. 9, 1982, Pat. No. 4,472,092. This application Aug. 1, 1984, Ser. No. 636,486

Int. Cl.⁴ B22C *7/02*

U.S. Cl. 164—45 **16 Claims**



1. In apparatus for transporting wax structure including a replica of a golf club head between first and second positions, said structure having a gate, the combination comprising

(a) a support relatively movable into adjacency to said structure,

(b) prong means associated with said support and movable relative thereto between retracted and advanced positions, the prong means in advanced position or positions penetrating said gate for carrying said wax structure during said transporting,

(c) and including auxiliary means to soften a local surface area of said wax gate whereby said softened area may be adhered to transport means for transport thereby, after retraction of said prong means from said gate.

14. In the method of transporting wax structure between first and second positions, and including

(a) a support relatively movable into adjacency to said structure,

(b) prong means associated with said support and movable relative thereto between retracted and advanced positions,

the steps that include

(i) advancing said prong means in non-parallel directions into said advanced position penetrating said wax structure,

(ii) displacing said support and prong means to transport said wax structure,

(iii) and wherein said wax structure has an associated gate penetrated by the prong means pursuant to step (i) and including the step of softening a local surface area of said wax gate whereby said softened area may be adhered to transport means for transport thereby, after retraction of said prong means from said gate.

4,577,670

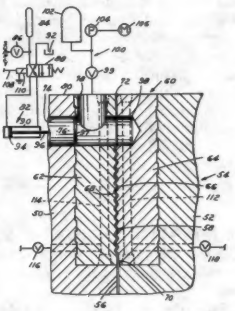
VACUUM CONTROL SYSTEM FOR CASTING MACHINE DIES

James I. Moore, Zeeland, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Jul. 19, 1984, Ser. No. 632,352

Int. Cl.⁴ B22D *17/14*

U.S. Cl. 164—155 **2 Claims**



1.) A cavity evacuation system for a casting machine having die halves defining a casting cavity with a vent opening therein comprising:

vacuum system means with a receiver for accommodating the air volume of the casting cavity;

means defining a chill block assembly having first and second halves forming a vent passage for venting molten material from the cavity when the cavity is filled with casting material;

means including a reciprocating plug with a vacuum-on position and a vacuum-off position for controlling communication between said receiver and the casting cavity; said plug being positioned in its vacuum-on position to cause evacuation of the casting cavity through said vent passage; said reciprocating plug having an O.D. segment extending across said vent passage and having an end face thereon in sealing engagement with one of said halves when in its vacuum-off position to cause vented molten material to encircle the O.D. of the plug in the vent passage without imposing molten material pressure forces on said end face so as to block communication between said receiver and said vent passage during the casting process.

4,577,671

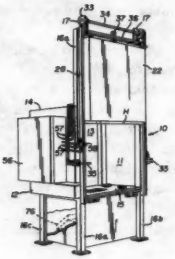
CASTING DECORING DEVICE

Mark C. Stephan, 333 S. Hazel St., Upper Sandusky, Ohio 43351

Continuation-in-part of Ser. No. 406,349, Aug. 9, 1982, abandoned. This application Jun. 21, 1984, Ser. No. 623,028

Int. Cl.[4] B22D *29/00*

U.S. Cl. 164—401 3 Claims



1. A casting decoring device comprising in combination an enclosure having side walls, a top and apertured bottom, a door on said enclosure having a main support frame with a sound isolation panel secured thereto and a plurality of roller assemblies thereon, means for soundproofing said enclosure, a door guide means on said enclosure, a pair of door clamps comprising pneumatic piston and cylinder assemblies selectively activated mounted on said enclosure movably engaging said door assembly in sealing relation to said enclosure, a support fixture removably positioned within said enclosure, isolation means on said support fixture isolating said fixture from said apertured bottom, said isolation means comprising isolation bags positioned between an isolation support plate and said support fixture, a plurality of locator wells on said apertured bottom aligned with support feet extending from said isolation support plate, a pneumatic gun removably secured on said support fixture, means for centrally controlling said pneumatic gun and said door clamps in an interdependent controlled cycle.

4,577,672

DEVICE FOR MANUFACTURING METAL STRIP

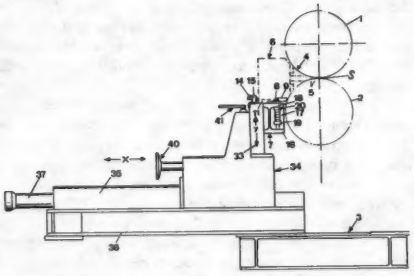
Bruno Frischknecht, Gwatt, and Rolf Würgler, Esslingen, both of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Oct. 11, 1983, Ser. No. 540,778

Claims priority, application Switzerland, Oct. 18, 1982, 6068/82

Int. Cl.[4] B22D *11/06*

U.S. Cl. 164—428 18 Claims



1. Device for horizontal casting of metal strip which comprises two substantially vertically disposed rolls of a roll type continuous casting unit one above the other having a roll gap therebetween, a supporting section mounting said rolls, a substantially horizontally disposed nozzle which introduces molten metal into said gap, a nozzle beam mounting said nozzle including an inlet channel which includes facing, turret-shaped projections which accommodate plates for limiting the casting width, a slide supporting said nozzle beam such that the slide is moveable in the substantially horizontal direction (x), a rail on which said slide moves and a power drive for moving said slide.

4,577,673

GUIDE ROLL

Shinichi Harada, Kobe; Yoshinobu Ishihara, Takatsuki, and Shigeru Matsushita, Nishinomiya, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

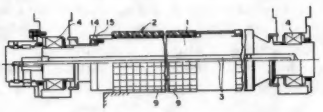
Filed Jul. 12, 1983, Ser. No. 513,092

Claims priority, application Japan, Jul. 13, 1982, 57-105888[U]; Jul. 13, 1982, 57-105887[U]; Aug. 2, 1982, 57-118098[U]

The portion of the term of this patent subsequent to Mar. 25, 2003, has been disclaimed.

Int. Cl.[4] B22D *11/12*

U.S. Cl. 164—448 14 Claims



1. A guide roll having a ceramic sleeve around a circumference of a steel roll shaft with an internal cooling water passage formed therein, said guide roll comprising:

a cylindrical ceramic sleeve including a plurality of discrete ceramic segments forming a plurality of annular rings;

means for unitarily and individually fitting each of said rings around said circumference and along the length of said roll shaft such that said ceramic segments are each restricted at least in radial and circumferential directions of said roll shaft; and

first and second end plates securely fixed to opposite ends of said roll shaft for holding said rings in position on the circumference of said roll shaft wherein said roll shaft includes a plurality of axial grooves formed on the circumference thereof and said rings further comprise a plurality of said ceramic segments each having a leg portion, said ceramic segments being aligned in an axial direction and having said leg portions respectively slidably fitted in said axial grooves formed on the circumference of said roll shaft.

4,577,674

GUIDE ROLL

Shinichi Harada; Hiroshi Toyoda, both of Kobe; Katsuhiko Honma, Akashi, and Shigeru Matsushita, Nishinomiya, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Jul. 22, 1983, Ser. No. 516,280

The portion of the term of this patent subsequent to Mar. 25, 2003, has been disclaimed.

Int. Cl.[4] B22D *11/12*

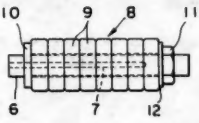
U.S. Cl. 164—448 10 Claims

1. A guide roll, comprising:

a steel core shaft internally provided with a cooling water passage along an axis thereof;

a ceramic sleeve covering a circumferential portion of said core shaft wherein said ceramic sleeve further comprises a plurality of separable annular ceramic segments loosely fitted on and along a length of said core shaft; and

fixing means for holding said annular ceramic segments in an axially abutted state on said core shaft wherein said fixing



means further comprises an end plate fixed to a first end of said core shaft and a nut tightly threaded on a second end of said core shaft opposite said first end.

4,577,675

CERAMIC GUIDE ROLLS FOR USE IN CONTINUOUS CASTING

Yoshinobu Ishihara, Osaka, and Shinichi Harada, Kobe, both of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

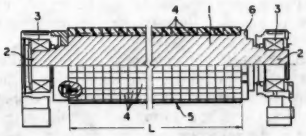
Filed Aug. 2, 1983, Ser. No. 519,713

Claims priority, application Japan, Aug. 2, 1982, 57-118097[U]

The portion of the term of this patent subsequent to Mar. 25, 2003, has been disclaimed.

Int. Cl.⁴ B22D *11/12*

U.S. Cl. 164—448 **4 Claims**



1. A ceramic guide roll having a steel core and a cylindrical ceramic sleeve positioned around the circumference of the steel core shaft, said cylindrical ceramic sleeve consisting of an assembly of a plurality of discrete ceramic segments, said guide roll comprising:

a stopper member provided at a first end of said steel core shaft; and

a segment retainer attached to a second end of said steel core shaft opposite said first end; and

resilient means for holding said ceramic segments constantly in abutting engagement with each other in the axial direction of said steel core shaft in cooperation with said stopper member.

4,577,676

METHOD AND APPARATUS FOR CASTING INGOT WITH REFINED GRAIN STRUCTURE

William G. Watson, Cheshire, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Dec. 17, 1984, Ser. No. 682,530

Int. Cl.⁴ B22D *11/124, 27/02*

U.S. Cl. 164—468 **19 Claims**

1. A method for producing a cast metallic ingot having refined grain structure, comprising the steps of:

providing a casting mold;

supplying a metallic melt to said casting mold;

intermittently cooling a section of said mold to form a narrow zone of fine dendrites having secondary dendrite arms on an inner peripheral surface of said mold;

reheating said zone of fine dendrites to detach secondary dendrite arms from said fine dendrites;

mixing said detached secondary dendrite arms in said melt to provide nuclei for grain refinement of said cast ingot; and

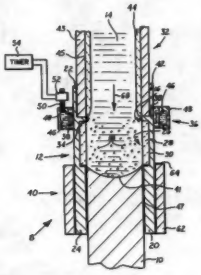
solidifying said melt into a cast ingot having a relatively refined grain structure.

13. An apparatus for casting a metallic melt into an ingot with a refined grain structure, comprising:

a direct chill casting mold having an inlet section and outlet section, said casting mold having an inner peripheral surface between said inlet section and said outlet section, said casting mold having an insulated section disposed on the inner peripheral surface between said inlet sections and said outlet sections;

feed nozzle means disposed in said inlet section for pouring a melt into said mold;

a narrow zone along the inner peripheral surface of said casting mold between said feed nozzle means and said insulated section, said narrow zone being in contact with said melt flowing through said mold;



means for intermittently cooling an outer peripheral surface of said casting mold that includes and extends upstream and downstream from said narrow zone along the inner peripheral surface for solidifying said melt into a thin zone of dendrites with secondary dendrite arms

and for detaching the secondary dendrite arms;

means for mixing the detached secondary dendrite arms with said melt in the insulated section of said casting mold to provide nuclei for grain refinement of said cast ingot; and

means for solidifying said melt into a casting having a relatively refined grain structure.

4,577,677

METHOD FOR CLEANING HEAT EXCHANGERS

Robert C. Ezzell, Teesside, Great Britain, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 25, 1985, Ser. No. 715,310

Claims priority, application United Kingdom, Jan. 7, 1985, 8500316

Int. Cl.⁴ F28G *13/00*

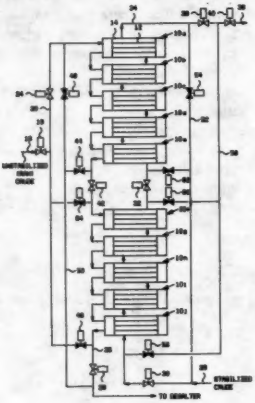
U.S. Cl. 165—1 **7 Claims**

1. A method of operating a heat exchange system of the type adapted to receive two fluids therethrough such that heat is exchanged between the fluids, wherein the system comprises a plurality of heat exchangers connected in series such that a fluid passed to a first exchanger in the series is passed successively through each exchanger in the series, a portion of the exchangers making up a first group of exchangers and the remainder making up a second group of exchangers, said method comprising the steps:

(a) passing a first fluid and a second fluid through the entire system for a period of time such that heat exchange between the first and second fluids occurs, wherein the first fluid is at a higher temperature than the second fluid upon entering the system, and wherein the first fluid is passed through the first group before being passed to the second group;

(b) terminating flow of second fluid through the first group of exchangers after completion of step (a) while continu-

ous flow of first fluid is maintained through the entire system for a period of time, wherein no other materials are



introduced into the system during this step, whereby the system is cleaned.

4,577,678

STORAGE MATERIAL FOR HEAT TRANSFER

Martin Frauenfeld, Heidelberg, and Rüdiger von Wedel, Heiligkreuzsteinach-Eiterbach, both of Fed. Rep. of Germany, assignors to Kraftanlagen AG, Heidelberg, Fed. Rep. of Germany

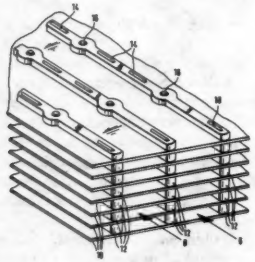
PCT No. PCT/EP84/00189, § 371 Date Mar. 22, 1985, § 102(e) Date Mar. 22, 1985, PCT Pub. No. WO85/00879, PCT Pub. Date Feb. 28, 1985

PCT Filed Jun. 23, 1984, Ser. No. 718,022

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1983, 3328548

Int. Cl.[4] F28D *17/02, 19/04*

U.S. Cl. 165—10 11 Claims



1. Storage material for the transfer of heat between gas streams in heat exchangers, composed of stick-like molded spacing elements and a plurality of plate-like molded elements (12) serving as storage elements of heat-resistant plastic, which are assembled into storage blocks, characterized in that the molded elements (10; 12; 32) are made from polyetherimide.

4,577,679

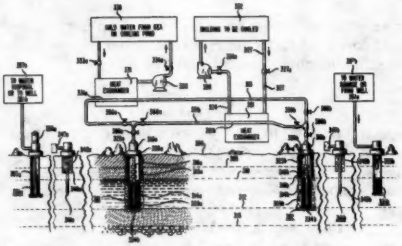
STORAGE SYSTEMS FOR HEAT OR COLD INCLUDING AQUIFERS

Henry J. Hibshman, 1325 Watchung Ave., Plainfield, N.J. 07060

Filed Oct. 25, 1978, Ser. No. 954,666

Int. Cl.[4] F28D *21/00*

U.S. Cl. 165—45 18 Claims



1. A system for storing heat or cold in material aquifers in the form of hot or cold water, comprising in combination:

a first subsystem for heat or cold utilization disposed above ground-water level including a first set of conduits with circulating heat-transfer fluid;

a second subsystem including a second set of conduits connected to means in heat-transfer relation with said first subsystem;

said second subsystem including at one terminal a core well configuration extending substantially vertically down from ground level to an aquifer stratum disposed below said ground level for storing hot or cold water, and connected at the other terminal to means for returning at a point spaced apart from said core well configuration, water derived from said means in heat transfer with said first subsystem;

and means for at least partially controlling the thermal and hydraulic gradients surrounding said core well configuration.

4,577,680

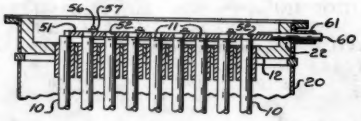
AIR RECUPERATOR CLEANER

Jack L. Clem, and Oscar T. Scott, IV, both of Borger, Tex., assignors to J. M. Huber Corporation, Borger, Tex.

Filed May 23, 1984, Ser. No. 613,110

Int. Cl.[4] F28G *13/00*

U.S. Cl. 165—95 10 Claims



1. In an air recuperator having a plurality of individual recuperator tubes supported at a discharge outlet by a tube sheet and carried within a shell through which a heat transfer medium is passed in thermal contact with the exterior surface of the recuperator tubes to transfer heat from a finely-divided particle-bearing transport gas passing through the recuperator tubes to the heat transfer medium, and wherein the finely-divided particles adhere to the interior surface of the recuperator tubes, the improvement comprising

a shutter plate having a plurality of apertures formed therein and positioned adjacent to the discharge outlet end of the plurality of individual recuperator tubes, with each such

discharge outlet end aligned with one of said plurality of apertures permitting the uninterrupted flow of the particle-bearing transport gas therethrough, and

means for abruptly sliding said shutter plate across the discharge outlet end of said plurality of individual recuperator tubes to block each such discharge outlet end for loosening the finely-divided particles adhering to the interior surface of the recuperator tubes.

4,577,681

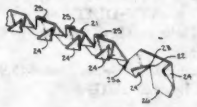
HEAT EXCHANGER HAVING A TURBULATOR CONSTRUCTION

Dennis R. Hughes, Germantown, Wis., assignor to A. O. Smith Corporation, Milwaukee, Wis.

Filed Oct. 18, 1984, Ser. No. 662,346

Int. Cl.[4] F28F *13/12*

U.S. Cl. 165—109.1 **4 Claims**



1. In a heat exchanger, a generally cylindrical tube, a turbulator freely disposed in said tube, said turbulator comprising a generally flat strip of metal having a plurality of spaced transverse slits, each of said slits extending from a side edge of the strip more than one-half the width of the strip and terminating at a base, generally triangular edge portions of said strip bordering each slit being disposed generally normal to the strip, a first edge portion bordering each slit extending laterally from one side of the strip and a second edge portion bordering said slit extending laterally from the opposite side of said strip, an end portion of the strip extending from the base of one of said slits to a corresponding end of the strip being disposed at an acute angle to the remainder of the strip, said end portion being firmly engaged with said tube to retain the turbulator in said tube.

4,577,682

HEAT EXCHANGER

Jack S. Yampolsky, and David P. E. Carosella, Jr., both of San Diego, Calif., assignors to GA Technologies Inc., San Diego, Calif.

Filed Aug. 30, 1984, Ser. No. 645,999

Int. Cl.[4] F28F *9/22*

U.S. Cl. 165—160 **4 Claims**

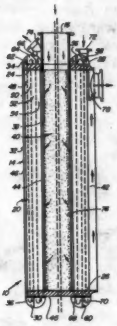
1. Heat exchange apparatus comprising:

a generally cylindrical tank defining a longitudinal axis and having an inlet port for entry of a first fluid and an outlet port for exit of said first fluid;

an annular tube bundle disposed within said tank, said annular tube bundle comprising a plurality of elongated metal tubes, said annular tube bundle defining a longitudinal axis substantially parallel to that of said tank and offset therefrom, and having a generally cylindrical interior communicating with said inlet port so as to define an axial inlet plenum for said first fluid;

means for effecting flow of said first fluid into said inlet plenum and thence outward through said tube bundle over said tubes; and

means for effecting flow of a second fluid through the interiors of said tubes to effect heat transfer between said first fluid and said second fluid;



said outlet port being located on said tank substantially diametrically opposite said axis of said annular tube bundle whereby an asymmetrical outlet. Plenum is defined within said tank outside of said annular tube bundle.

4,577,683

HEAT EXCHANGER WITH SEPARATE HELICAL DUCTS

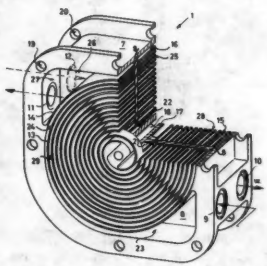
Heinz Kelch, Königsfeld, Fed. Rep. of Germany, assignor to Kienzle Apparate GmbH, Villingen-Schwenningen, Fed. Rep. of Germany

Filed May 25, 1984, Ser. No. 614,447

Claims priority, application Fed. Rep. of Germany, May 28, 1983, 3319521

Int. Cl.[4] F28D *7/10*

U.S. Cl. 165—164 **9 Claims**



1. A heat exchanger for indirect heat transfer between fluid media flowing in ducts disposed in close thermal relation, comprising a duct member extending around a generally central axis and laterally enclosing a space, said duct member having a pair of opposite ends extending transversely of the central axis, first means extending transversely of the central axis of said duct member and spaced in the axial direction of said duct member from the opposite ends thereof for dividing said space into a first partial space and a second partial space, second means extending transversely of said first means for dividing each of said first and second partial spaces into a first duct and a separate second duct each having a pair of opposite ends within each of said first and second partial spaces, third means extending in the axial direction of and spaced inwardly from said duct member between said first partial space and said second partial space for affording a flow connection between the first ducts in said first and second partial spaces and between the second ducts in said first and second partial spaces, fourth means extending transversely of the central axis of said duct member and across each of the opposite ends of said duct

member for forming a sealed closure for each of said first and second partial spaces, said second means comprises a pair of webs helically wound in each of said first and second partial spaces and extending from adjacent said duct member around said central axis inwardly toward said central axis, one of the opposite ends of each of said first and second ducts being located adjacent said duct member and the other located at said third means, and an inlet member for said first ducts connected to the said duct member and opening into said first partial space and an outlet member for said first ducts connected to said duct member and opening from said second partial space, an inlet member for said second ducts connected to said duct member and opening into said second partial space and an outlet member for said second ducts connected to said duct member and opening from said first partial space for flowing the fluid media therethrough so that it passes through said first and second ducts in each of said first and second partial spaced in counterflow relation.

4,577,684

PROFILED-TUBE HEAT EXCHANGER

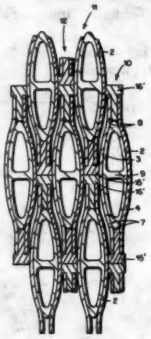
Klaus Hagemeister, Munich, Fed. Rep. of Germany, assignor to MTU Motoren- und Turbinen-Union Munchen GmbH, Munich, Fed. Rep. of Germany

Filed Aug. 13, 1984, Ser. No. 640,396

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1983, 3329202

Int. Cl.[4] F28F *9/00*

U.S. Cl. 165—172 **17 Claims**



1. In a heat exchanger having a plurality of tubes of oblong cross-section arranged in spaced relation to longitudinal columns and transverse rows to establish a matrix field in which a fluid flows in a longitudinal direction around the tubes for heat exchange with fluid flowing in the tubes, the tubes in adjacent transverse rows being transversely offset from one another with the ends of the tubes in one row interposed between the ends of the tubes of adjacent rows,

the improvement comprising:

means interposed between adjacent tubes in adjacent rows and columns for maintaining the position of the tubes in the matrix field,

said means comprising a pair of profiled strips for each tube, said strips being disposed in said matrix field in a common plane extending perpendicular to said tubes, each profiled strip including a portion curved in shape in conformance with said tube, said curved portions of said strips being secured to respective opposite sides of said tube to substantially surround said tube, each tube and the pair of profiled strips secured therewith being freely expandible lengthwise of the tubes independently of the adjacent tubes and strips, said strips further including ends extending longitudinally beyond the ends of the associated tube to be interposed between strips of adjacent tubes at the center of the curved portions of said adjacent tubes, and connecting members inserted between said ends of the strips of each tube to form with said ends, spacers for said tubes and contact locations of said strips and said tubes to resist torsional deformation of the matrix field,

said tubes each including a central transverse web at the center of said curved portions.

4,577,685

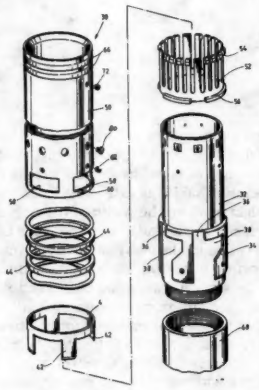
NIPPLE PROTECTOR SLEEVE FOR USE IN A WELL CONDUIT

William D. Eatwell, Houston, Tex., assignor to Camco, Incorporated, Houston, Tex.

Filed Aug. 31, 1984, Ser. No. 645,982

Int. Cl.[4] E21B *23/00*

U.S. Cl. 166—115 **2 Claims**



1. A nipple protector sleeve for a well conduit comprising,

a body including supporting means for engaging no go lugs on the interior of a nipple in a well conduit for supporting the body from the well nipple,

releasable latching means on the body for releasably latching the body to the no go lugs for preventing longitudinal and rotative movement of the body relative to the nipple,

a sleeve section telescopically engaging the body and engaging said latching means for releasing said latching means and releasing said body when the section is moved relative to the body,

said supporting means including,

an annular ridge about the exterior of the body,

a slot extending upwardly through the ridge whereby a no go lug may enter the bottom of the slot,

a recess offset from and in communication with the slot between the top and bottom of the ridge for receiving a no go lug,

the top of the slot receiving a portion of the latching means for movement in the top of the slot for locking and releasing a no go lug in the recess, and

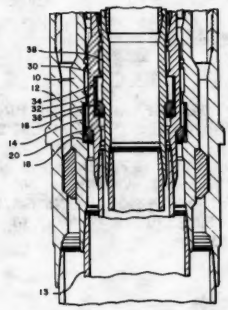
spring means engaging the latching means and yieldably urging the latching means into the slot.

4,577,686

MUDLINE SUPPORT HANGER ASSEMBLY

Lionel J. Milberger; Glen E. Lochte, both of Houston, and Anthony J. Masciopinto, Kingwood, all of Tex., assignors to Vetco Offshore, Inc., Ventura, Calif.

Filed Apr. 26, 1984, Ser. No. 604,199
Int. Cl.[4] E21B *23/02*
U.S. Cl. 166—208 4 Claims



1. A mudline support hanger assembly for supporting a second hanger body within a first hanger body comprising:

a first hanger body having an inside diameter and a vertically extending horizontally oriented slot around its inner circumference, and a load surface near the lower end of the slot;

a substantially elliptical support ring having its major outside diameter greater than the inside diameter of said first hanger body and its minor outside diameter less than the inside diameter of said first hanger body, a support surface at the lower edge of said support ring, a landing surface on the top of said support ring for supporting a later run second hanger body, the inside diameter of said support ring being substantially circular and significantly smaller than said first hanger body inside diameter sufficient to support the second hanger body; and

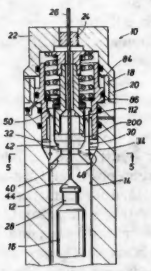
said support ring thereby being capable of passing vertically through the interior of said first hanger body when rotated at an angle around its minor diameter axis, but fitting within said slot when in a horizontal position.

4,577,687

CABLE HEAD CATCHER MECHANISM

C. P. Lanmon, II, Longview, Tex., assignor to Hydrolex, Inc., Longview, Tex.

Filed Feb. 27, 1984, Ser. No. 583,864
Int. Cl.[4] E21B *33/072, 23/000*
U.S. Cl. 166—243 22 Claims



1. A cable head catcher mechanism for establishing releasable latching engagement with a fishing neck of a cable supported well tool to provide structural support preventing downward movement of the fishing neck and well tool, comprising:

(a) housing means defining a passage through which a wire line cable of the well tool is capable of extending;

(b) collet means being disposed within said housing means and being radially yieldable to permit upward passage of the fishing neck of the well tool into said collet means, said collet means defining catching shoulder means for engagement with a catching surface of said fishing neck;

(c) means positioning said collet means at a radially restrained position within said housing means and being yieldable to permit movement of said collet means to expanded fishing neck receiving and releasing positions within said housing means; and

(d) operator means being linearly movable within said housing means for selectively moving said segmented collet means linearly to a position inducing radial expansion of said collet means to the releasing position thereof for selective release of the fishing neck therefrom.

4,577,688

INJECTION OF STEAM FOAMING AGENTS INTO PRODUCING WELLS

Zean Z. Gassmann; Jeffrey T. Hawkins, and Alfred Brown, all of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 576,694, Feb. 3, 1984, abandoned. This application Aug. 8, 1984, Ser. No. 638,920
Int. Cl.[4] E21B *43/24, 43/30*
U.S. Cl. 166—245 12 Claims

3. A process for recovering hydrocarbons from an underground hydrocarbon formation penetrated by at least one injection well and at least one production well, which comprises:

injecting into a production well a mixture of steam and about 0.01% to about 5% by weight of a foaming agent, based upon the weight of steam in the injected mixture,

said foaming agent represented by the formula,

$$RO(R'O)_nR''SO_3^-M^+,$$

where R is an alkyl radical, branched or linear, having from about 15 to about 21 carbon atoms in the alkyl chain, R' is ethyl or propyl, n has an average value of about 2 to about 5, R'' is ethyl, propyl, hydroxypropyl or butyl, and M^+ is an alkali metal or ammonium ion;

injecting steam into said production well; and

recovering hydrocarbons and other fluids from a nearby well.

4,577,689

METHOD FOR DETERMINING TRUE FRACTURE PRESSURE

Charles E. Dotson, Houston, Tex., assignor to Completion Tool Company, Houston, Tex.

Filed Aug. 24, 1984, Ser. No. 644,043
Int. Cl.[4] E21B *47/06, 33/16*
U.S. Cl. 166—250 6 Claims

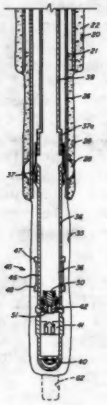
5. A method for determining the fracture pressure of earth formations below a cemented pipe in well bore comprising the steps of:

lowering a pipe into a well bore containing well control liquid where the pipe has a casing shoe and an inflatable packer with an elastomer packing element located proximate to the casing shoe until the casing shoe is located just above the bottom of the well bore;

injecting a volume of cement through the pipe by using a well control fluid under pressure behing the volume of cement and displacing the well control fluid in the well bore in front of the volume of cement through the annulus between the pipe and the well bore until the cement fills

the annulus between the pipe and the well bore and the lower end of the pipe above the inflatable packer;

before the cement sets, inflating the inflatable packer with cement in the pipe under pressure for compressing the packing element between the cement and wall of the borehole and for stressing the earth formations contacted by the packing element of the inflatable packer;



after the cement sets, removing the casing shoe and obtaining access to the earth formations below the end of the liner; and

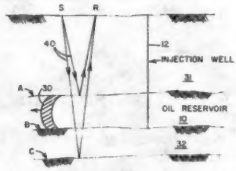
applying pressure to the well control fluid in the pipe until the fracture pressure of the earth formations below the pipe is determined, and discontinuing the application of pressure upon determining the fracture pressure.

4,577,690

METHOD OF USING SEISMIC DATA TO MONITOR FIREFLOODS

William L. Medlin, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 18, 1984, Ser. No. 601,465
Int. Cl.[4] E21B *43/243, 47/00*
U.S. Cl. 166—251 **3 Claims**



1. A method for identifying the extent of travel of a combustion front through a subterranean oil reservoir from an injection well following an in situ combustion operation for the recovery of oil from the reservoir, comprising the steps of:

(a) energizing a source of seismic energy;

(b) receiving seismic reflection signals from boundaries between subterranean formation mediums exhibiting seismic velocity contrasts; and

(c) identifying the extent of travel of the combustion front through the oil reservoir from the injection well by detecting

(i) the presence of a seismic reflection signal from a first point on an overlying or underlying reservoir boundary which is absent at a spaced apart second point along said overlying or underlying reservoir boundary due to the combustion front having traveled to a location between said first and second points on said overlying or underlying reservoir boundaries, or

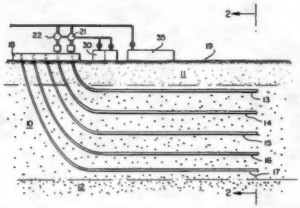
(ii) the absence of a seismic reflection signal from a first point on an overlying or underlying reservoir boundary which is present at a spaced apart second point along said overlying or underlying reservoir boundary due to the combustion front having traveled to a location between said first and second points on said overlying or underlying reservoir boundaries.

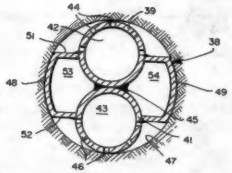
4,577,691

METHOD AND APPARATUS FOR PRODUCING VISCOUS HYDROCARBONS FROM A SUBTERRANEAN FORMATION

Wann-Sheng Huang, and Sze-Foo Chien, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Sep. 10, 1984, Ser. No. 649,260
Int. Cl.[4] E21B *43/24, 43/30*
U.S. Cl. 166—263 **8 Claims**





1. Method for thermally enhanced production of a viscous hydrocarbon fluid from a productive layer of a formation in which the viscous hydrocarbon is releasably held, whereby to progressively heat discrete segments of the formation to decrease the viscosity of said hydrocarbon fluid, which method includes the steps of;

forming in said formation a plurality of substantially parallel well completions which extend in a generally horizontal direction and which are vertically spaced apart one from the other to define a series of contiguous horizontal formation segments striated by the respective well completions,

selectively introducing steam to the upper one of said contiguous horizontal formation segments whereby to release hydrocarbon fluid therefrom and to enhance the downward flow of a hot hydrocarbon emulsion, and

producing said hydrocarbon emulsion from said horizontal well completion positioned at the lower side of said upper horizontal formation segment, and thereafter individually heating said discrete horizontal formation segments one at a time in descending order, and producing emulsion form each of said horizontal segments by way of the well completion immediately below the heated segment.

5. A well liner for insertion into a horizontal extending well bore within a productive formation which releasably holds a viscous hydrocarbon, to release the hydrocarbon by thermal

stimulation through the introduction of a hot pressurized heating medium into said formation, which well liner includes

a plurality of discrete conductors disposed one above the other, that are capable of selectively directing said pressurized heating medium into the formation, and of conducting the hydrocarbon emulsion therefrom,

perforations formed in the walls of said discrete conductors,

lateral panels which depend from and commonly engage the respective conductors, each of which panels includes a contoured wall positioned to slidably engage the adjacent well bore wall during insertion of the liner into said well bore.

4,577,692

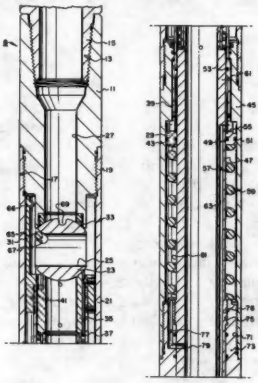
PRESSURE OPERATED TEST VALVE

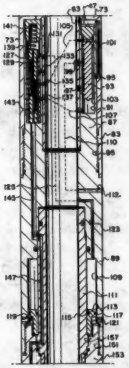
Daniel R. Reardon, Houston, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed Mar. 4, 1985, Ser. No. 707,914

Int. Cl.[4] F21B *34/10*

U.S. Cl. 166—321 **11 Claims**





1. A pressure operated test valve for use in a well test string in a well bore, the test string having a packer arranged for sealing the well bore to isolate the annulus between the well bore and the test string above the packer from that portion of the well bore below the packer, comprising:

a rotating ball valve movable between open and closed positions relative to the interior of the test string;

a ball piston for shifting said rotating ball between said open and closed positions;

biasing means for urging said ball piston to its valve closing position;

a power fluid reservoir containing a power fluid;

an axially shiftable power valve located within a power chamber, said power valve having opposed piston faces exposed by means of fluid passageways to fluid in said power fluid reservoir; and

an axially slidable control valve located within a control chamber, said control valve having a pressure responsive annular area exposed to said power fluid for shifting said control valve and having internal passages for supplying pressurized power fluid to a selected face of said power valve to shift said power valve between a first position which isolates said ball piston and a second position which exposes said ball piston to annulus fluid pressure for shifting said ball to said open position.

4,577,693

WIRELINE APPARATUS

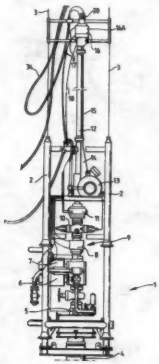
James A. Graser, Newton of Forbes, Alford, Aberdeenshire AB3 8PU, Scotland

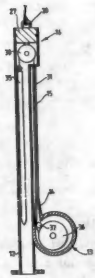
Filed Jan. 15, 1985, Ser. No. 691,554

Claims priority, application United Kingdom, Jan. 18, 1984, 8401315

Int. Cl.[4] E21B *19/08*

U.S. Cl. 166—338 **7 Claims**





1. Subsea wireline apparatus comprising

(a) a feed tube sealingly engageable with a subsea wellhead so that the interior of the feed tube communicates in use with a subsea drill hole,

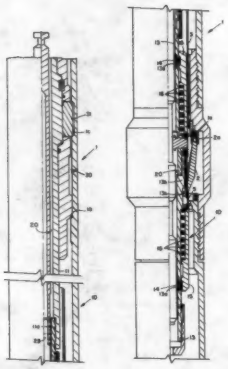
(b) a wireline extending within the feed tube and having means for receiving a tool to be transported into the drill hole,
(c) a housing whose interior communicates sealingly with the interior of the feed tube, the housing and the feed tube forming parallel arms of an inverted U-shaped passageway,
(d) a winch mechanism disposed within the housing and having a portion of the wireline secured thereto,
(e) a sealing cap in sealing engagement with the housing,
(f) means for releasing the sealing cap from the housing,
(g) connection means on the sealing cap for attachment of lifting means thereto, and
(h) a pulley mounted on the sealing cap and around which the wireline passes.

4,577,694

PERMANENT LOCK OPEN TOOL

William L. Brakhage, Jr., Broken Arrow, Okla., assignor to Baker Oil Tools, Inc., Orange, Calif.

Filed Dec. 27, 1983, Ser. No. 565,380
Int. Cl.[4] E21B *34/06, 23/00*
U.S. Cl. 166—382 **20 Claims**



1. Apparatus for permanently locking a shiftable valve in a well conduit in an open position comprising: a mandrel; a resiliently expandable peripheral lock element surrounding said mandrel, shiftable latch means mounted on said mandrel to retain said lock element in a peripherally contracted position; and means operable by movement of said mandrel for shifting said latch means to a non-retaining position relative to said contracted lock element, thereby permitting said resilient lock element to peripherally expand to lock said shiftable valve in the open position.

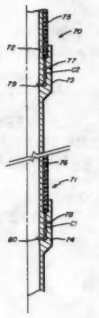
16. The method of permanently depositing a peripherally expandable element within the bore of a well tool comprising the steps of:
(1) Peripherally contracting the peripherally expandable element about a tubular run-in tool, said run-in tool including an axially shiftable mandrel;
(2) Securing each axial end of the contracted peripherally expandable band by a separate axially shiftable latch; and
(3) Concurrently moving saift shiftable latches by a single axial movement of said mandrel to simultaneously release both axial ends of the peripherally expandable band to expand into the desired position in the tool bore and permit withdrawal of the run-in tool.

4,577,695

SEQUENTIAL INFLATABLE PACKER

Edward T. Wood, Kingwood, Tex., assignor to Completion Tool Company, Houston, Tex.

Filed Apr. 4, 1984, Ser. No. 596,666
Int. Cl.[4] E21B *33/12*
U.S. Cl. 166—387 **5 Claims**



1. A method of setting more than one inflatable packer means in sequence while disposed in a casing string in a well bore traversing earth formations including the steps of:
disposing at least two inflatable packer means in a longitudinally spaced apart relationship in a tubular casing string in a well bore traversing earth formations where said well bore contains fluid, and said packer means each have inflatable packer elements which are responsive to fluid under pressure in the casing string to inflate into a sealing relationship with a wellbore;
applying pressure to the fluid in the interior of the casing string sufficient to cause fluid to flow through a passage from the interior of the casing string to the interior space behind each of said inflatable packer elements;
controlling the flow rate of fluid in the passage to the interior space behind each of said inflatable packer elements at predetermined different flow rates so that the inflation of the packer elements occurs simultaneously but progressively in a upward direction with the lowermost packer means inflating faster than the next above packer means,
controlling said predetermined different flow rates independently of the amount of pressure applied to the fluid.

4. Apparatus for use in a well bore traversing earth formations comprising:
first and second inflatable packer means coupled in a string of tubular casing traversing earth formations where the well bore contains fluid and each of said packer means has inflatable packer elements which are inflatable into sealing engagement with a well bore,
first means including a first passageway for transmitting fluid under pressure from the interior of the string of casing to an interior space behind said inflatable packer element in said first packer means for inflating such packer element, a first flow rate control valve system in said first passageway for controlling the flow rate of fluid to the interior space behind said inflatable packer element to provide a first flow rate of inflation, said first flow rate control valve system including,
first means for receiving fluid flow from the interior of the mandrel at a first pressure value,
first pressure loss means for developing a second pressure value lower than said first pressure value in response to fluid flow through said pressure loss means, and
first flow rate regulating means for regulating the fluid flow from said pressure loss means and for providing fluid flow at a given flow rate to the internal space between the

mandrel and the inflatable element, as a function of said first and second pressure values,

said first flow rate regulating means having a first variable flow regulating member between said pressure loss means and said internal space and first means for controlling said regulating member as a function of said first and second pressure values,

second means including a second passageway for transmitting fluid under pressure from the interior of the string of casing to an interior space behind said inflatable packer element in said second packer means for inflating such packer element, second flow rate control valve system in said second passageway for controlling the flow rate to the interior space behind said inflatable packer element to provide a second flow rate of inflation, said second flow rate control valve system including,

second means for receiving fluid flow from the interior of the mandrel at a first pressure value,

second pressure loss means for developing a second pressure value lower than said first pressure value in response to fluid flow through said pressure loss means, and

second flow rate regulating means for regulating the fluid flow from said pressure loss means and for providing fluid flow at a given flow rate to the internal space between the mandrel and the inflatable element, as a function of said first and second pressure values,

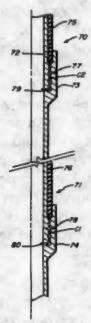
said second flow rate regulating means having a second variable flow regulating member between said pressure loss means and said internal space and second means for controlling said regulating member as a function of said first and second pressure values, p1 said first and second pressure loss means being functionally related to one another to provide a higher flow rate of fluid in a lowermost packer means than in the next above packer means for inflating a packer element on the lowermost packer means into sealing engagement with a wellbore prior to inflating a packer element on a packer means into sealing engagement with a well bore.

4,577,696

SEQUENTIAL INFLATABLE PACKER

George O. Suman, Houston, Tex., assignor to Completion Tool Company, Houston, Tex.

Filed Apr. 5, 1984, Ser. No. 596,854
Int. Cl.[4] E21B *33/12*
U.S. Cl. 166—387 4 Claims



1. A method of setting more than one inflatable packer means in sequence while disposed in a casing string in a well bore traversing earth formations including the steps of:

disposing at least two inflatable packer means in a longitudinally spaced apart relationship in a tubular casing string in a well bore traversing earth formations where said well bore contains fluid, and said packer means each have inflatable packer elements which are responsive to fluid under pressure in the casing string to inflate into a sealing relationship with a wellbore;

applying pressure to the fluid in the interior of the casing string sufficient to cause fluid to flow through a passage from the interior of the casing string to the interior space behind each of said inflatable packer elements;

controlling the flow rate of fluid in the passage to the interior space behind each of said inflatable packer elements at different flow rates so that the inflation of the packer elements occurs simultaneously but progressively in a upward direction with the lowermost packer means inflating faster than the next above packer means.

4. Apparatus for use in a well bore traversing earth formations comprising:

first and second inflatable packer means coupled in a string of tubular casing traversing earth formations where the well bore contains fluid and each of said packer means has inflatable packer elements which are inflatable into sealing engagement with a well bore,

first means including a first passageway for transmitting fluid under pressure from the interior of the string of casing to an interior space behind said inflatable packer element in said first packer means for inflating such packer element, first flow rate control means in said first passageway for controlling the flow rate of fluid to the interior space behind said inflatable packer element to provide a first flow rate of inflation,

second means including a second passageway for transmitting fluid under pressure from the interior of the string of casing to an interior space behind said inflatable packer element in said second packer means for inflating such packer element, second flow rate control means in said second passageway for controlling the flow rate to the interior space behind said inflatable packer element to provide a second flow rate of inflation,

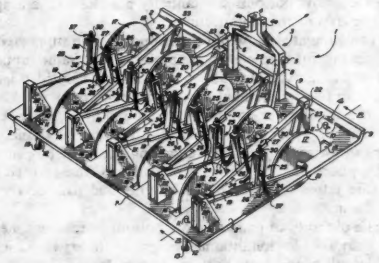
said first and second flow rate control means being functionally related to one another to provide a higher flow rate of fluid in a lowermost packer means than in the next above packer means for inflating a packer element on the lowermost packer means into sealing engagement with a wellbore prior to inflating a packer element on a packer means into sealing engagement with a well bore.

4,577,697

SOD CUTTING APPARATUS

Ross D. Moak, Rte. 1, Box 33, Athens, La. 71003

Filed Mar. 19, 1984, Ser. No. 591,025
Int. Cl.[4] A01B *45/02*
U.S. Cl. 172—21 19 Claims



1. A sod cutting apparatus comprising:

(a) a slide member;

(b) at least one slot provided in longitudinal orientation in said slide member;

(c) at least one fulcrum secured to said slide member in substantial alignment with said slot;

(d) at least one hinge arm having one end pivotally attached

to said fulcrum and the opposite end of said hinge arm extending to said slot;

(e) at least one blade means rotatably secured to said opposite end of said hinge arm and positioned in registration with said slot; and

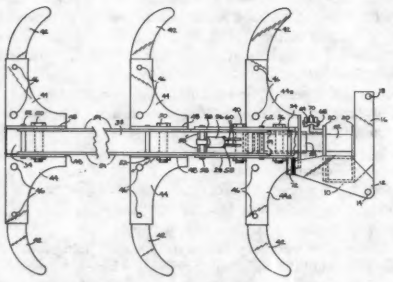
(f) an adjusting bracket attached to said hinge arm, a bolt extending upwardly through said adjusting bracket, bias means attached to said bolt and to said slide member and a nut threadably secured on said bolt for maintaining said bolt in said adjusting bracket, adjusting the tension in said bias means and adjusting the depth of penetration of said blade means into the soil beneath said slide member when said slide member is caused to traverse the soil by a motive force.

4,577,698

VARIABLE WIDTH TWO-WAY GANG PLOW

Glen A. Watts, Rte. 3, Box 120, McMinnville, Oreg. 97129

Filed Jan. 20, 1984, Ser. No. 572,677
Int. Cl.[4] A01B *3/42*
U.S. Cl. 172—225 **5 Claims**



1. A two-way gang plow comprising:

(a) a main frame having horizontal axis pivot means for attachment to a tractor,

(b) a plow bottom frame support mounted on the main frame for rotation about the longitudinal axis of the main frame,

(c) power means interconnecting the main frame and the plow bottom frame support for rotating the latter,

(d) a pair of plow bottom attachment members secured in fixed position to the plow bottom frame support,

(e) a plow bottom secured detachably to each of said fixed plow bottom attachment members, the latter being positioned to dispose the plane of the land sides of the associated plow bottoms substantially parallel to the longitudinal axis of the main frame,

(f) an elongated plow bottom support frame supported adjacent its forward end by the plow bottom frame support for pivotal movement about a vertical axis displaced laterally from the longitudinal axis of the main frame for adjusting the angular disposition of the plow bottom support frame relative to the longitudinal axis of the main frame,

(g) adjustment means interengaging the plow bottom frame support and the plow bottom support frame for adjusting the latter relative to the longitudinal axis of the main frame,

(h) a plurality of pairs of plow bottom attachment members disposed at longitudinally spaced intervals along the length of the plow bottom support frame,

(i) a plow bottom secured detachably to each plow bottom attachment member, each plow bottom having a land side,

(j) pivot means securing each pair of plow bottom attachment members to the plow bottom support frame for pivotal movement about an axis extending parallel to the plane of the land sides of the associated plow bottoms, and

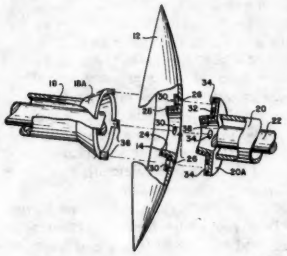
(k) a tie rod member pivotally interconnecting all of the pivoted plow bottom attachment members and secured pivotally adjacent its forward end to the plow bottom frame support for pivoting all said pivoted attachment members simultaneously and to the same degree for maintaining the planes of the land sides substantially parallel to the longitudinal axis of the main frame.

4,577,699

CUSHION MOUNTED DISC WITH INTERCONNECTING SPOOL ASSEMBLY

Robert B. Rottinghaus, 4121 S. Canfield Rd., Jesup, Iowa 50648

Filed Mar. 13, 1984, Ser. No. 589,201
Int. Cl.[4] A01B *61/00, 71/04*
U.S. Cl. 172—570 **12 Claims**



1. A yieldable disc assembly for use on a shaft rotatably mounted to an implement, said assembly comprising:

a disc having a conical hub portion with a center aperture within which said shaft is positioned and a plurality of peripheral apertures spaced around said center aperture;

a first spool section positioned on said shaft adjacent a first lateral portion of said disc, said first spool section including a first end portion adapted to receive said hub in complementary tight-fitting relation and including a plurality of spacer means extending therefrom;

a second spool section positioned on said shaft adjacent a second, opposing lateral portion of said disc, said second spool including a second end portion adapted to receive said hub in complementary tight-fitting relation; and

first and second resilient spacer members respectively positioned between said disc hub and said first and second spool sections and around the center aperture of said disc, each of said resilient spacer members including a center aperture aligned with the center aperture of said disc and a plurality of peripheral apertures positioned around said center aperture for receiving a respective spacer means therein, wherein a distal end of each of said spacer means is maintained in flush alignment with a peripheral surface on said second end portion of said second spool section, wherein each of said first and second resilient spacer means further includes an outer, generally flat peripheral portion containing said outer peripheral apertures and abutting facing, generally flat surfaces of said disc and an inner conical portion positioned in tight fitting relation with the conical hub portion of said disc.

4,577,700

METHOD AND SYSTEM FOR DISPLACING DRILLING FLUID FROM A DRILL STRING IN A WELL DRILLING SYSTEM

Thomas B. Dellinger, Duncanville; William G. Boston, Dallas; James H. Sexton, Duncanville, and Robert T. Strong, Plano, all of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 16, 1984, Ser. No. 600,698
Int. Cl.[4] E21B *19/00, 21/10, 47/04*
U.S. Cl. 175—40 **13 Claims**

1. In the rotary drilling of a wellbore with a drill string,

formed with a plurality of sections of drill pipe, and having a drill bit at the lower end thereof, the method of disconnecting and breaking out at least one section of drill pipe from said drill string at a select drill string joint with minimized drilling fluid spillage, comprising steps of:

(a) pulling the drill string out of the wellbore,

(b) continuously rotating the drill string with a top drive drilling motor and circulating drilling fluid through said drill string while said drill string is being pulled from the wellbore,

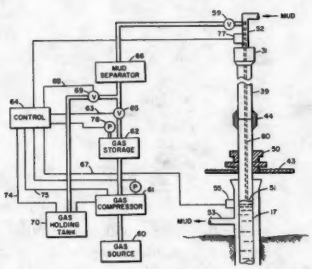
(c) stopping said drill string rotation and said drilling fluid circulation when a select drill string joint is above the drilling rig floor,

(d) injecting compressed gas into the drill string to displace the drilling fluid in that portion of the drill string above said select drill string joint,

(e) stopping the injection of compressed gas into the drill string when the drilling fluid level has fallen below said select drill string joint, and

(f) breaking out that portion of the drill string above said selected drill string joint.

8. In a well drilling system wherein a power rotating means delivers torque to rotate a drill string suspended from a traveling block moving in response to movement of a cable arranged over multiple sheaves mounted in a crown block, the drill string turns a bit drilling a borehole into subsurface formations and a drilling fluid is circulated to keep the bit and bottom of the borehole cleaned of cuttings, a system for breaking out a portion of the drill string which has been pulled out of the well after drilling operations, comprising:



(a) a source of compressed gas,

(b) a first valve which is opened to allow compressed gas from said source to be injected into the drill string,

(c) means for sensing the level of the drilling fluid into the drill string as the ompressed gas displaces the drilling fluid,

(d) means for closing said first valve to stop the injection of compressed gas into the drill string when the sensing means indicates the drilling fluid level to be below that portion of the drill string which is to be broken out,

(e) a second valve which is opened following the closing of said first valve to vent the compressed gas from the drill string, and

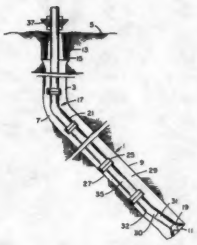
(f) means for breaking out said portion of the drill string upon the completion of the venting of said compressed gas.

4,577,701

SYSTEM OF DRILLING DEVIATED WELLBORES

Thomas B. Dellinger, Duncanville, and Wilton Gravley, Farmers Branch, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 8, 1984, Ser. No. 638,915
Int. Cl.[4] E21B *7/04, 7/08*
U.S. Cl. 175—61 **4 Claims**



1. A system for the rotary drilling of a deviated wellbore into the earth, comprising

(a) a drill string,

(b) a drill bit,

(c) a drill motor for rotating said drill bit independently of rotation of said drill string,

(d) a bent sub affixing said drill motor to the lower end of said drill string for directing the axis of rotation of said drill bit such that it is angularly displaced from the axis of said drill string,

(e) a measuring-while-drilling system for providing an indication of the directivity of said wellbore,

(f) means responsive to said measuring-while-drilling system for rotating said drill string along with the independent rotation of said drill bit for effecting a straight path for said wellbore, and

(g) means responsive to said measuring-while-drilling system for stopping the rotation of said drill string and maintaining only rotation of said drill bit for effecting a change in the direction of the wellbore from said straight path.

4,577,702

METHOD OF PREVENTING DRILL STRING OVERFLOW

Ben V. Faulkner, Washington, Okla., assignor to Faulkner Oil Field Services, Inc., Washington, Okla.

Filed Mar. 28, 1985, Ser. No. 717,497
Int. Cl.[4] E21B *7/00, 17/00*
U.S. Cl. 175—65 **12 Claims**

1. A method of preventing drilling fluid overflow when raising a drill string suspended within a well bore and removing drill pipe sections therefrom comprising the steps of:

connecting a tool joint in said drill string near the bottom end thereof, said tool joint including at least one shear plug sealingly attached thereto for providing a drilling fluid flow passageway from the interior to the exterior of said tool joint when sheared;

shearing said shear plug in said tool joint whereby drilling

fluid contained in said drill string is drained therethrough when said drill string is raised; and then

raising said drill string and removing drill pipe sections therefrom.

4,577,703

APPARATUS FOR MAKING BOREHOLES IN THE LATERAL WALLS OF NARROW UNDERGROUND MINE WORKINGS

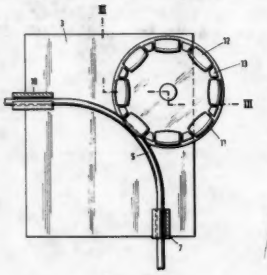
Frieda Cyriacy, Berliner Ring 61, 7150 Backnang; Horst Albers, Sanatorium Calmette, 7542 Schömberg, and Ingeborg Havemann, Schwarenbergs Trasse 50, 7000 Stuttgart, all of Fed. Rep. of Germany

Filed Dec. 20, 1983, Ser. No. 563,410

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1982, 3247921

Int. Cl.[4] E21B 7/04

U.S. Cl. 175—79 19 Claims



1. In apparatus for drilling boreholes into the lateral mining face of subterranean mining areas of narrow width having: a movable drilling means transportable within the mining area; means for propelling and advancing a drill bit attached to a drill shaft provided with a passage for a flushing fluid, and formed in part with a flexible spiral and including a drive unit for rotating the drill shaft and advancing the drill shaft in the direction of movement of the drilling means; and including a deflection unit positioned behind the drive unit on the drilling means for diverting the flexible steel spiral of the drill shaft to move the core bit in the direction of work at an angle to the direction of movement of the drill shaft, the improvement wherein the flexible spiral is formed with flat opposing surfaces contacting each other and wherein the passage for flushing fluid comprises a hose running inside the flexible spiral provided at its ends with pipe extensions and coupling pieces secured to the ends of the flexible spiral sealing the pipe extension and therefore said hose thereto.

4,577,704

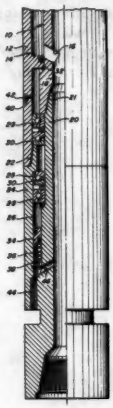
BEARING SYSTEM FOR A DOWNHOLE MOTOR

James T. Aumann, Salt Lake City, Utah, assignor to Norton Christensen, Inc., Salt Lake City, Utah

Filed Sep. 15, 1980, Ser. No. 187,011

Int. Cl.[4] E21B 4/02

U.S. Cl. 175—107 4 Claims



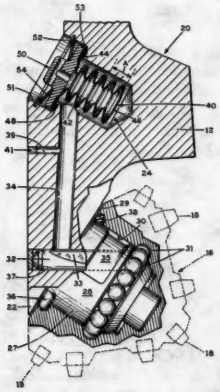
1. A bearing means for the driven shaft of a rotating tool in an oil well or the like, the driven shaft being hollow to convey drilling fluid flowing down the drill string to a drill bit, there being a motor adapted to rotate the driven shaft and wherein the drilling fluid is forced down the drill string under pressure to flow through and then out of the drill bit to clear debris from around the drill bit and flush the debris out of the well, comprising relatively stationary tubular means supported from the lower end of the drill string having an interior wall forming a chamber, said driven shaft extending downwardly through said chamber and having its outer wall spaced from the interior wall of said tubular means, said shaft supporting said drill bit on its lower end and being rotatably supported within said chamber with the tool extending beyond the lower end of said tubular means, main bearing means within said chamber for rotatably supporting said driven shaft, oil seal means in said chamber disposed above and below said main bearing means, one of said sealing means including a piston that is longitudinally slidable in said chamber, oil for lubricating said bearing means being confined between said seals within said chamber, said oil seal means being exposed to the pressure of the fluid flowing down through the hollow shaft to said tool before the fluid enters the well being drilled, and a restricted passage to allow drilling fluid to flow outwardly from between and to the outside of said driven shaft and said tubular means into said well said restricted passage serving to maintain internal fluid pressure against said piston whereby there is substantially no pressure drop across the lubricant chamber seals, all of the radial thrusts of the driven shaft being taken up by said main bearing means.

4,577,705

BELLOWS LUBRICANT PRESSURIZER FOR SEALED BEARING ROCK BITS

Donald G. Cross, Laguna Beach, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Apr. 23, 1984, Ser. No. 602,771
Int. Cl.[4] E21B 9/08
U.S. Cl. 175—228 6 Claims



1. A means for pressurizing a bearing lubrication system for a sealed bearing rotary cone rock bit prior to use of said bit in a drilling operation, said rock bit consisting of a bit body with at least one rotary cutter cone rotatively secured to a journal bearing projecting from a leg extending from said body, said pressurizing means comprising:

a grease reservoir chamber formed in said body of said bit,

conduit means formed within said body and leg in communication with said reservoir and bearing surfaces formed between said at least one cutter cone and said journal bearing projecting from said leg,

seal means positioned between said rotary cutter cone and said journal bearing,

a pressure responsive cover cap adapted to release internal pressure in excess of 160 pounds per square inch for said reservoir chamber,

a lubricant distributed within said reservoir chamber, conduit means and between said bearing surfaces, and

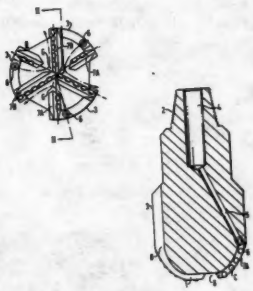
means to pressurize said lubricant within said rock bit lubrication system to establish a positive internal pressure differential to prevent liquid and detritus from entering said bit past said seal and cover cap means to said bearing surfaces during operation of said rock bit, said means to pressurize said lubricant within said reservoir is a convoluted metal bellows entrapped within said reservoir chamber, said convoluted bellows being compressed to exert a predetermined positive pressure differential between 75 and 150 pounds per square inch, the pressure differential is between the internal lube system and the outside of the bit.

4,577,706

ROTARY DRILL BITS

John D. Barr, Cheltenham, England, assignor to NL Petroleum Products Limited, London, England

PCT No. PCT/GB83/00227, § 371 Date May 10, 1984, § 102(e) Date May 10, 1984, PCT Pub. No. WO84/01186, PCT Pub. Date Mar. 29, 1984
PCT Filed Sep. 16, 1983, Ser. No. 611,008
Claims priority, application United Kingdom, Sep. 16, 1982, 8226466
Int. Cl.[4] E21B 10/00, 10/60, 10/46
U.S. Cl. 175—329 14 Claims



1. A rotary bit for use in drilling a borehole in a subsurface formation comprising a bit body having a central bore, the body having a leading face and a trailing gauge region, said gauge region having a plurality of generally longitudinally-extending, circumferentially spaced flow slots recessed thereinto for permitting flow of fluid longitudinally along said gauge region, and a plurality of flow-restrictive surfaces interposed between said flow slots for contacting the wall of such borehole, walls on the bit dividing the leading face into fluid channels, cutting elements on at least some of the walls, passageways connecting the central bore to openings in the fluid channels, wherein, as to at least one of said openings, the nearest portion of said gauge region generally radially aligned with said opening is an adjacent one of said flow-restrictive surfaces, wherein at least two wall portions are arranged relative to such opening so that most of the fluid emerging therefrom is directed to travel in a path inwardly along said leading face towards the central axis of the bit and then to one of said slots in the gauge region, at least some of said cutting elements being disposed in said path, the adjacent flow restrictive surface of said gauge region being adapted to cooperate with the wall of such borehole to inhibit fluid from such opening from flowing directly outwardly in a generally radial direction and thence along said gauge region.

4,577,707

METHOD OF AND APPARATUS FOR COMBINATORIAL COMPUTATION

Masao Fukuda, Shiga, Japan, assignor to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Nov. 29, 1982, Ser. No. 445,013
Claims priority, application Japan, Nov. 30, 1981, 56-193343
The portion of the term of this patent subsequent to Apr. 16, 2002, has been disclaimed.
Int. Cl.[4] G01G 19/22, 19/52
U.S. Cl. 177—25 3 Claims

1. An apparatus for combinatorial computation comprising:

a plurality of weighing heads charged with batches of articles to be weighed, for respectively weighing the batches of articles and for generating respective weighing data items;

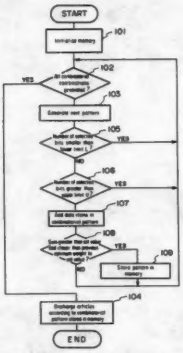
a combinatorial pattern generating unit for successively

generating combinatorial patterns corresponding to combinations of the weighing data items;

a combinatorial processing unit, coupled to said weighing heads and said combinatorial pattern generating unit, for adding the weighing data items according to the combinatorial patterns generated by said combinatorial pattern generating unit;

a numerical range setting unit for setting a range with upper and lower limits for the number of weighing data items required to take part in the adding operation of said combinatorial processing unit; and

a range discriminator, coupled to said combinatorial pattern generating unit, said combinatorial processing unit, and said numerical range setting unit, for determining whether the number of weighing heads, corresponding to a combination of the weighing data items according to a combinatorial pattern produced by said combinatorial pattern generator, falls within the range set by said numerical range setting unit, and for skipping the adding operation and causing said combinatorial pattern generator to produce a next combinatorial pattern when said number of weighing heads falls outside of said range, the lower limit of the range set by said numerical range setting unit being greater than zero and less than substantially half the number of weighing heads, the upper limit being less than the total number of weighing heads and greater than substantially half the number of weighing heads, whereby combinations of weighing data items corresponding to a number of weighing heads which is less than all of said weighing heads, will be added together to find a combination of weighing data items which is equal or closest to a set value.



4,577,708

WEIGHING APPARATUS

Richard M. Brook, Huddersfield, England, assignor to Autosystems Limited, Huddersfield, England

Filed Aug. 17, 1984, Ser. No. 641,590

Claims priority, application United Kingdom, Sep. 2, 1983, 8323557

Int. Cl.[4] **G01G** *19/00, 19/04;* **B65G** *17/32*

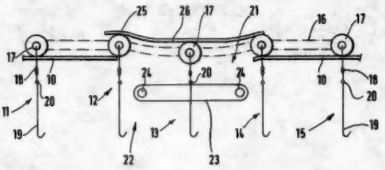
U.S. Cl. 177—145 **8 Claims**

1. Apparatus for weighing a succession of articles, said apparatus comprising:

a weighing device positioned at a weighing station, said weighing device having a weighing surface;

a plurality of article carriers, each said article carrier including a first part and an associated second part for carrying an article, said first and second parts being movable relative to each other in a vertical direction, said first parts being interconnected for moving said carriers through said weighing station, each said second part including a contact surface engageable with said weighing surface, each said contact surface and said weighing surface being in substantially the same plane in said weighing station;

means for lowering each said first part in said weighing station when each said contact surface and said weighing surface are in contact with each other to thereby transfer



to said weighing surface the weight of the article carried by the associated second part while maintaining adjacent second parts in said weighing station in the same vertical position with respect to each other, whereby physical interference between adjacent articles in the weighing station is minimised.

4,577,709

WEIGHING SCALE WITH A LOAD CELL

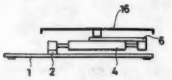
Yoshihumi Shibahara, and Akira Komoto, both of Shiga, Japan, assignors to Shimadzu Corporation, Kyoto, Japan

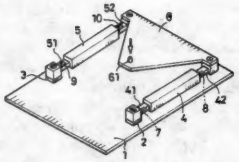
Filed Dec. 22, 1983, Ser. No. 565,019

Claims priority, application Japan, Dec. 24, 1982, 57-229607

Int. Cl.[4] **G01G** *3/14, 3/08, 21/24;* **G01L** *1/22*

U.S. Cl. 177—211 **4 Claims**





1. A weighing scale in which a load cell is used to detect a weight value to be measured, said weighing scale comprising:

two parallel cantilevers with the free ends connected to each other through a connecting means, which provides a loading portion;

four strain gauges as strain detecting means, every two of which are stuck separately on two predetermined strain-detecting portions in the longitudinal direction of each of said two parallel cantilevers; and

a weighing tray connected to said loading portion,

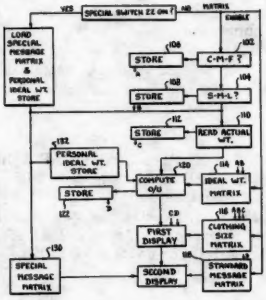
said two parallel cantilevers, said connecting means and said four strain gauges constituting a load cell having four strain detecting means; and

the outputs from said four strain gauges giving the weight value of a weight placed on said weighing tray.

4,577,710
APPARATUS FOR PROMOTING GOOD HEALTH

Edward Ruzumna, 3974 Winterset Ct., West Bloomfield, Mich. 48003

Filed Dec. 12, 1983, Ser. No. 560,341
Int. Cl.[4] G01G *23/00*
U.S. Cl. 177—245 2 Claims

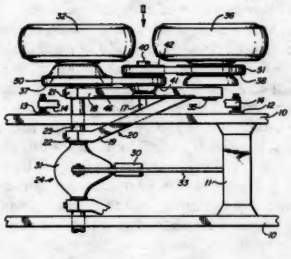


1. Apparatus for promoting good health and addressing both the user's weight and a particular medical condition other than departure of the user's weight from a standardized weight but which bears a medically recognized correlation with departure of a user's weight from a standardized weight, comprising a scale having a weighing platform onto which a user steps, a display for displaying information to the user standing on the platform and control means acting upon the measured weight of the user and certain other inputs, including an electronic medium which is manually installable on and removable from the apparatus and contains data relating to the particular medical condition correlated with departure of measured weight from standardized weight, to provide messages on the display relating to both departure of the user's measured weight from a standardized weight and also to the particular medical condition with respect to which departure of measured weight from desired weight has a medically recognized correlation, the particular message presented on the display relating to the particular medical condition being developed from departure of the user's measured weight from standardized weight.

4,577,711
TANDEM WHEEL FLEXIBLE DRIVE SUSPENSION

Claude O. Butler, 7074 Brentwood Dr., Brentwood Bay Post Office British Columbia, Canada V0S 1A0

Filed May 24, 1984, Ser. No. 614,110
Claims priority, application Canada, Oct. 24, 1983, 439573
Int. Cl.[4] B62D *61/10*
U.S. Cl. 180—24.1 16 Claims



1. A tandem rear wheel assembly for a vehicle, the assembly comprising:

(a) an axle having a drivable first pair of wheels mounted thereon;

(b) a pair of arms, each arm having its one end secured to the axle at a position between the centre of the axle and a respective one of the wheels mounted thereon, the arms extending from the axle in generally parallel spaced relation and being of equal length;

(c) a second pair of wheels, each wheel of the second pair of wheels being mounted for rotation on the other end of a respective one of the pair of arms, the rotational axes of the second pair of wheels being parallel to the axle;

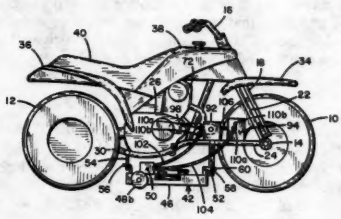
(d) actuable drive connection means being positioned between each wheel of the second pair of wheels and a respective one of the first pair of wheels, each wheel of the second pair of wheels being adapted to be driven by the respective one of the first pair of wheels during actuation of the drive connection means; and

(e) a suspension assembly, the suspension assembly extending from the frame of the vehicle to a central position on the arms.

4,577,712
OFF-THE ROAD VEHICLE FOR RECREATIONAL AND WORK APPLICATIONS

Douglas C. Foote, Coon Rapids, and James E. Grinde, Anoka, both of Minn., assignors to Yamaha Hatsudoki Kabushiki Kaisha, Japan

Filed Aug. 31, 1984, Ser. No. 645,821
Int. Cl.[4] B60K *17/28*
U.S. Cl. 180—53.4 9 Claims



1. In combination with an off-the-road motor power recreational vehicle of the type comprising at least one steering front wheel, two relatively large size, low pressure driving rear wheels, an engine unit mounted in the vicinity of the center of a vehicular body for transmitting the revolutions of the output shaft of said engine unit to said rear wheels through a transmission, and a rider's seat arranged above and at the back of said engine unit, a means for rapidly converting said recreational vehicle to a working vehicle and vice versa comprising:

(a) a hydraulic pump means adapted to be driven by said output shaft at a point upstream of said transmission;

(b) a hydraulic fluid reservoir;

(c) a manually operable hydraulic pump clutch interposed between said engine output shaft and said pump means;

(d) a hydraulic motor coupled in driving relation to a working accessory;

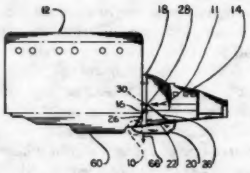
(e) quick-disconnect coupler means disposed in a hydraulic line connecting said hydraulic pump to said hydraulic motor, said quickdisconnect coupler means having valve members for preventing hydraulic fluid from flowing out of said lines when said coupler is in its separated state; and

(f) means for rapidly coupling and uncoupling said working accessory to and from said vehicular body.

4,577,713
AUTOMOTIVE ENGINE OIL DRIP PAN

Donald A. Moon, 7000 Brighton Rd., Brighton, Mich. 48116

Filed Feb. 8, 1984, Ser. No. 577,957
Int. Cl.[4] B62D *25/20*
U.S. Cl. 180—69.1 14 Claims

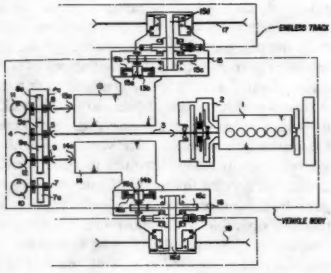


1. In combination with an oil lubricated automotive vehicle engine and powertrain combination wherein the engine has a power output coupled to the powertrain so that power from the engine can be delivered through the powertrain for propelling the vehicle, said engine having a bearing and seal adjacent the operative coupling of its power output with the powertrain, the improvement which comprises means to collect oil which leaks through the bearing and seal comprising an open-top pan disposed in association with the engine and powertrain to catch oil leaking from the bearing and seal, an oil absorbent medium disposed in said pan for absorbing oil, said medium having a preference for absorption of oil over water, and means for releasably mounting said pan on the engine and powertrain combination so as to secure the pan on the engine and powertrain combination during use and to permit the pan to be released to a position for replacement of the oil absorbent medium during service in which the engine has an oil pan at the bottom of the engine and wherein said open-top pan is disposed above and behind the bottommost portion of the engine oil pan such that said open-top pan does not decrease the road clearance of the vehicle nor extend forwardly of the bottommost portion of the engine oil pan.

4,577,714
POWER TRANSMISSION ARRANGEMENT FOR A HYDROSTATICALLY DRIVEN VEHICLE

Noriyasu Tokunaga, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Dec. 20, 1983, Ser. No. 563,343
Int. Cl.[4] B60K *17/00*
U.S. Cl. 180—70.1 1 Claim



1. A power transmission arrangement for a hydrostatically driven vehicle having a vehicle body and a pair of endless tracks each mounted on each side of the vehicle body comprising:

a prime mover mounted at the rear of the vehicle;

a power transmission shaft connected to said prime mover;

power distributor means mounted on a front section of the vehicle body, said power distributor means having a power input connectible to said power transmission shaft and at least two power outputs;

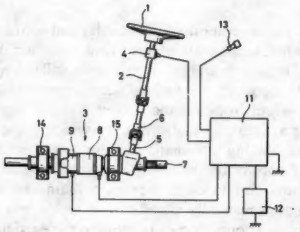
a pair of pump and motor units each unit being mounted on either side of the vehicle body relative to said power transmission shaft, intermediate said prime mover and said power distributor means, and forming a hydrostatic transmission, each unit having a power input connectible to the power output of said power distributor means and a power output; and

a pair of final drive means for driving said endless tracks, each of said final drive means being connectible to a power output of said pump and motor unit.

4,577,715
POWER ASSIST STEERING GEAR ASSEMBLY

Naoki Saito, Maebashi, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 16, 1984, Ser. No. 631,071
Claims priority, application Japan, Jul. 22, 1983, 58-132828
Int. Cl.[4] B62D *5/04, 5/06*
U.S. Cl. 180—79.1 3 Claims



1. Power assist steering assembly for vehicles comprising:

rotary shaft means connected to a steering wheel to be rotated in unison therewith;

an elongated member linearly movable in opposite directions for pivoting of dirigible wheels;

rack and pinion gear means for drivingly connecting the rotary shaft means and the elongated member, the gear means including a pinion gear rotatable in unison with the rotary shaft means and a rack gear provided on the elongated member at a first axial position and disposed in meshing engagement with the pinion gear;

ball screw and nut means including thread means provided on the elongated member at a second axial position, rotatable nut means circumscribing at least a portion of said thread means and ball means for transmitting force between said nut means and said thread means;

an electric motor disposed at a third axial position axially between the first and second positions and including a stator, a rotor and a rotation output member connected to the rotor, the stator, rotor and rotation output member being coaxially arranged around the elongated member;

rotation transmitting means from the motor to the nut means of the ball screw and nut means, the rotation transmitting means including electromagnetic clutch means disposed at a fourth axial position axially between the rotation output member of the motor and said nut means of the ball screw and nut screws, said electromagnetic clutch means being controlled independently of the motor and including a pair of radially extending clutch faces connected to said rotation output member and said nut means respectively and coil means for controlling the clutch faces electromagnetically so that when the clutch faces are brought into frictional contact with each other rotation of the motor is transmitted to the nut means and when the clutch

faces are spaced apart from each other the nut means is completely released from the motor;

means for detecting torque applied to the steering wheel; and

means for controlling the motor and the electromagnetic clutch means in response to detection of torque by the torque detecting means.

4,577,716

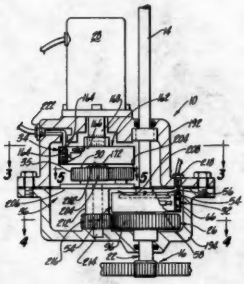
SERVO STEERING SYSTEM

Peter Norton, 170 Beaver Brook, Lincoln Park, N.J. 07035

Filed Jun. 21, 1984, Ser. No. 623,203

Int. Cl.[4] B62D *5/04*

U.S. Cl. 180—79.1 **26 Claims**



1. In a vehicle power steering system of the type comprising dirigible wheels, a manual input means, an electric servomotor, a steering gear, means for generating a torque signal corresponding to torque transmitted by said manual input means, and control means adapted to control energization of said servomotor in accordance with the torque signal, the improvement comprising:

restoring means responsive to turning of the dirigible wheels toward a straight ahead direction for controlling the energization of the servomotor to reduce its resistance to the turning of the dirigible wheels toward the straight ahead direction.

4,577,717

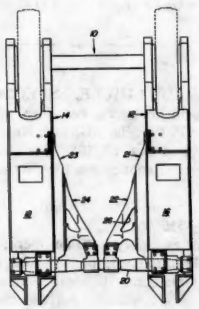
TRACK UNIT EXTENSION FOR WIDE TRACK CRAWLER VEHICLES

Joseph J. Smith, and Paul K. Erickson, both of Dubuque, Iowa, assignors to Deere & Company, Moline, Ill.

Filed May 17, 1982, Ser. No. 378,699

Int. Cl.[4] B62D *55/10*

U.S. Cl. 180—9.1 **2 Claims**



1. In a track frame assembly of the type including transversely spaced track frames, each of said track frames including fore-and-aft extending main frame portions, a transverse horizontal pivot shaft means extending between and connected to the main frame portions at a rearward location thereof, a plurality of inwardly and rearwardly extending generally diagonal braces, and means for securing a respective diagonal brace to a respective one of said main frames such that the rearward section of said braces are pivotally connected to said pivot shaft means, wherein the improvement comprises, said means for securing said respective diagonal brace to a respective one of said main frames including a spacer having a first member having a generally flat top surface and opposite outwardly extending end walls angled outward with respect to said top surface leading to respective outwardly extending mounting walls fixably mounted to a respective main frame, a plurality of second members each extending generally horizontally fixably mounted along a portion of its inward surface to a respective side of each one of said end walls of said first member, said top surface having a portion overhanging a portion of one side of each of said second member and fixably mounted thereto; said diagonal brace fixably mounted to said top surface of a respective one of said first member, said spacer being fixably mounted to a respective one of said main frame portions.

4,577,718

APPARATUS FOR CONTROLLING THE SPEED OF A VEHICLE WITH INTERNAL COMBUSTION ENGINE

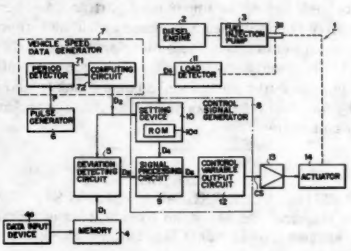
Masahito Ueno, Higashimatsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Japan

Filed May 3, 1984, Ser. No. 606,699

Claims priority, application Japan, May 4, 1983, 58-77570

Int. Cl.[4] B60K *31/04*

U.S. Cl. 180—179 **8 Claims**



1. A vehicle speed controlling apparatus for controlling the speed of an internal combustion engine with PID control to maintain the speed of a vehicle driven by the internal combustion engine at a desired target vehicle speed, said apparatus, comprising:

means for generating a first signal indicative of the desired target vehicle speed;

means for generating a second signal relating to the actual vehicle speed at each instant;

means for producing a load signal relating to the load of the internal combustion engine;

a deviation detecting means responsive to the first and second signals for producing a third signal indicative of the deviation of the actual vehicle speed from the target vehicle speed;

a signal generating means responsive to at least the load signal and the third signal for generating a control signal which has been signal processed in such a way that PID control of the speed of the internal combustion engine can be carried out in accordance with desired PID control characteristic dependent upon at least the load signal; and

means responsive to the control signal for driving a speed adjusting member of the internal combustion engine so as

to maintain the actual vehicle speed at the target vehicle speed.

4,577,719

MOTORCYCLE FUEL SYSTEM WITH FLOW FROM A MAIN TANK THROUGH A LOWER AUXILIARY TANK TO ITS ENGINE

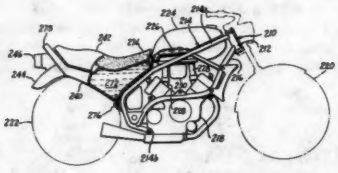
Kazuhiko Nomura; Hisashi Kazuta, and Hiroshi Kimura, all of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Division of Ser. No. 393,542, Jun. 30, 1982, abandoned, which is a continuation of Ser. No. 162,910, Jun. 25, 1980, abandoned. This application Dec. 12, 1984, Ser. No. 680,745

Claims priority, application Japan, Jun. 29, 1979, 54-83110; May 16, 1980, 55-64803; May 16, 1980, 55-64804

Int. Cl.[4] B60K *15/00*

U.S. Cl. 180—219 **3 Claims**



1. In combination with a motorcycle which has a main frame and an engine mounted to said frame, a fuel supply system for said engine comprising: an upper main tank having a filler neck for filling the same, and a lower outlet port; a separate auxiliary tank disposed at a lower elevation than said main tank, said auxiliary tank having an upper inlet port and a lower outlet port, both of said tanks being mounted to said motorcycle; first conduit means connecting the outlet port of said main tank to the inlet port of said auxiliary tank; and a second conduit means connecting the outlet port of said auxiliary tank to said engine, whereby fuel flow is from said main tank through said auxiliary tank to said engine.

4,577,720

MOTORCYCLE ENGINE COOLING SYSTEM

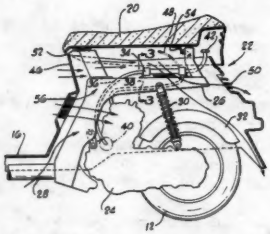
Masumi Hamane, and Masahiko Kimoto, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 9, 1983, Ser. No. 531,217

Claims priority, application Japan, Sep. 11, 1982, 57-138082

Int. Cl.[4] B60K *11/04*; B62M *7/06*

U.S. Cl. 180—229 **9 Claims**



8. A motorcycle having a rear body containing a rear mounted engine, comprising

a radiator mounted in the rear body above the rear mounted engine;

inlet openings in the front of the rear body;

a passage above the engine in the rear body from said inlet openings to said radiator; and

a seat above the rear body, said seat being hinged to allow access to said radiator.

4,577,721

FOUR-WHEEL DRIVE CAR

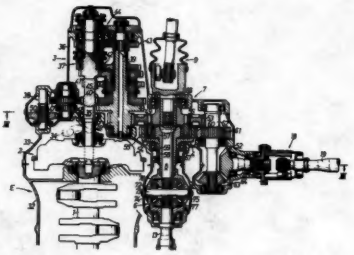
Noboru Ashikawa, Sayama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 6, 1984, Ser. No. 568,843

Claims priority, application Japan, Jan. 18, 1983, 58-6244; Jan. 18, 1983, 58-6245

Int. Cl.[4] B60K *17/344*

U.S. Cl. 180—248 **5 Claims**



1. A drive train in a four-wheel drive vehicle having an engine mounted on one end thereof with a crankshaft oriented transverse to the direction of vehicle travel, comprising:

a transmission having an output gear driven by the crankshaft and rotatable around an axis parallel to the axis of said crankshaft;

a reduction gear operatively engaged with said output gear;

a first differential gear having a gear and being concentrically engaged with said reduction gear to transmit the output of the reduction gear in a divided manner;

a second differential gear transmitting power from one output of said differential gear to left and right wheels of said one end of the vehicle;

a transmission gear meshing with said gear of the first differential gear for transmitting power from another output of said first differential gear in a direction generally perpendicular to the crankshaft through a propeller shaft to the other end of the vehicle, opposite said one end;

a third differential gear receiving power from said propeller shaft for transmitting power to left and right wheels on said other end; and

wherein a mesh portion where the transmission gear meshes with the gear of the first differential gear is closer to the crankshaft axis of engine than is the axis of said reduction gear.

4,577,722

COMMERCIAL VEHICLE, ESPECIALLY FORKLIFTER

Horst Schibisch, Leonberg, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Fed. Rep. of Germany

Filed Oct. 19, 1983, Ser. No. 543,419

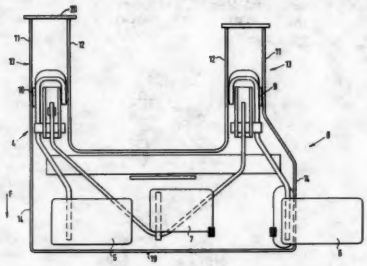
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1982, 3238597

Int. Cl.[4] G05G *1/14*

U.S. Cl. 180—315 **23 Claims**

1. A forklift assembly with an operator's platform mounted on the vehicle frame, said platform having mounting supports for actuating elements disposed beneath a floor plate, said elements being accessible from the operator's platform and connected by connecting lines with the devices to be actuated, the assembly comprising a on-piece tub-shaped housing mounted interchangeably by releasable fastening means be-

tween cross members in the bottom of the body structure of the vehicle, said tub-shaped housing being open toward the floor plate, and wherein the tub-shaped housing constitutes a pre-assembled module with operating elements and their connections and the bearing and the mounting supports of actuating elements are disposed within the tub-shaped housing in sealed off capsule-fashion from the interior of the vehicle by a floor plate which is held by fastening elements.

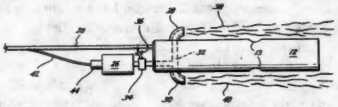


4,577,723

METHOD FOR IMPROVING THE EFFICIENCY OF AIR GUNS

Carl H. Savit, Houston, Tex., assignor to Western Geophysical Company of America, Houston, Tex.

Filed Aug. 3, 1981, Ser. No. 289,564
Int. Cl.⁴ G01V *1/02*
U.S. Cl. 181—120 **1 Claim**



1. A method for generating seismic waves in a body of water comprising the steps of:
   immersing an air gun, having at least one exhaust port, in said body of water;
   metering a desired amount of a selected long-chain polymer into the water around the exhaust port of said air gun; and
   firing said air gun.

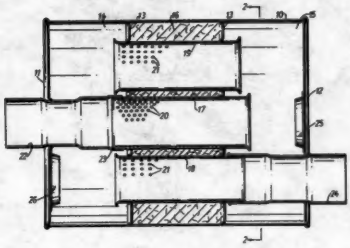
4,577,724

EXHAUST MUFFLERS FOR INTERNAL COMBUSTION ENGINES

David Vizard, Cheltenham, England, assignor to Shelburne Incorporated, Grand Terrace, Calif.

Division of Ser. No. 326,002, Nov. 30, 1981, Pat. No. 4,467,887.
This application Jun. 18, 1984, Ser. No. 621,874
Claims priority, application United Kingdom, Nov. 14, 1981, 8134369
The portion of the term of this patent subsequent to Aug. 28, 2001, has been disclaimed.
Int. Cl.⁴ F01H *1/08*
U.S. Cl. 181—265 **3 Claims**

1. An exhaust muffler comprising a closed chamber, an inlet pipe leading into the chamber, an outlet pipe leading from the chamber, two spaced bulkheads dividing the chamber into first and second buffer compartments separated by an intermediate compartment, at least three pass tubes extending through the bulkheads and across the intermediate compartment, two of the pass tubes forming continuations of the inlet and outlet pipes respectively and having open ends in the buffer compartments respectively, and a noise reflector located opposite the open end of at least one of the pass tubes, the noise reflector being aligned with said at least one pass tube and so shaped as to reflect down said at least one pass tube a portion of the noise carried by gases flowing along said at least one pass tube.

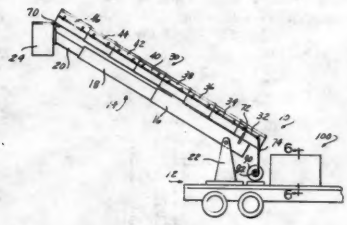


4,577,725

VEHICLE MOUNTED FIRE ESCAPE CHUTE

Danny P. Hunter, 17226 Eddon, Melvindale, Mich. 48122

Filed May 16, 1984, Ser. No. 610,955
Int. Cl.⁴ A62B *1/20*
U.S. Cl. 182—48 **5 Claims**



1. A fire escape chute for use on a vehicle having an extensible boom with a passenger basket attached at an upper end comprising:
   a fire escape chute mounted on the boom, the chute including a plurality of telescoping chute sections; and
   means for supporting the sides of the chute, the supporting means including:
   cables attached to opposite sides of the chute sections; and
   means, mounted on the vehicle, for applying tension to the cables to limit sideways movement of the chute sections.

4,577,726

SAILBOAT MAST LADDER

Gary Wheeler, 855 China Basin, San Francisco, Calif. 94107

Filed May 29, 1985, Ser. No. 738,923
Int. Cl.⁴ B63B *35/28, 29/20;* E06C *1/56, 9/14*
U.S. Cl. 182—93 **10 Claims**

1. A mast ladder for use with a mast on a sailboat of the type having a sail track along the length of the mast and a halyard extending from an upper portion of the mast, the mast ladder comprising:
   a flexible, flat support strap having inner and outer edges, first and second opposite sides, an upper end and a lower end;
   a plurality of foot loops extending from the first and second support strap sides at alternating positions along the support strap, the foot loops sized for receipt of a user's foot; and
   means for coupling the inner edge of the support strap to the sail track; whereby

securing the halyard to the upper support strap end permits the user to raise and lower the mast ladder along the mast

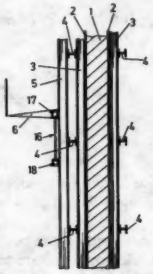
with the inner support strap edge guided along the sail track.

4,577,727

SCAFFOLD FOR THE CONSTRUCTION OF ROUND BUILDINGS OF CONCRETE OR THE LIKE

Peter Frei, Widnau, Switzerland, assignor to Patenver AG, Altstätten, Switzerland

Filed Jun. 16, 1983, Ser. No. 504,784
Claims priority, application Austria, Jun. 16, 1982, 2324/82
Int. Cl.[4] E04G *11/20, 17/14*
U.S. Cl. 182—128 13 Claims



1. A scaffold structure for the construction of a round building from concrete or like material, said structure comprising:

a mounting scaffold including a plurality of vertically spaced, horizontal, substantially annular polygonal rings;

a plurality of vertical supports supported on first sides thereof by said polygonal rings;

a horizontal substantially annular polygonal frame adapted to carry a working platform and to be movable vertically, said frame comprising a plurality of unitary frame portions;

each said frame portion having horizontally spaced opposite ends and comprising parallel horizontal upper and lower members extending longitudinally between said ends and members, including at least one inclined strut, connecting said upper and lower members in fixed vertically spaced relationship;

means for releasably connecting said frame portions end-to-end at varying relative angular relationships and thereby for forming polygonal frames of varying diameter; and

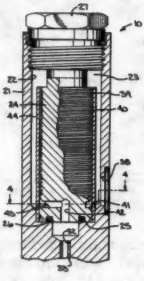
holding means on selected said horizontal members of said frame portions for adjustably connecting said frame to second sides of said vertical supports and thereby for adjusting the vertical height of said frame.

4,577,728

LUBRICANT METERING VALVE

Donald G. Gruett, Manitowoc, Wis., assignor to Oil Rite Corporation, Manitowoc, Wis.

Continuation of Ser. No. 489,258, Apr. 27, 1983, abandoned.
This application Dec. 5, 1984, Ser. No. 678,359
Int. Cl.[4] F16N *27/00;* F15D *1/00*
U.S. Cl. 184—7.4 3 Claims



1. In a valve for metering a liquid lubricant from a source of lubricant to a lubrication point, a valve body having a stepped through bore forming a valve chamber, said chamber having an inlet and outlet, said inlet providing for receipt of the lubricant to fill the chamber with a bath of the lubricant and said outlet being formed by a radially reduced portion of the bore that provides a shoulder serving as the floor of the chamber, a metering assembly disposed in the chamber and immersed in the bath of lubricant, said metering assembly comprising a cylindrical member having a base and a peripherally disposed spiral groove, a sleeve press fit on said cylindrical member to render the groove a closed spiral metering channel having an inlet at the upper end of the member for receiving lubricant from the chamber, said channel commuicating with an outlet in the base of said cylindrical member generally aligned with the bore outlet from the chamber, an O-ring seal disposed between the base of the member and the floor of the chamber and circumferentially relative to the aligned outlets, and means to depress the cylindrical member and thereby the O-ring seal to generally preclude passage of lubricant from the chamber to the lubrication point except by passage through the metering assembly.

4,577,729

GUIDE RAIL CLAMPING ASSEMBLY

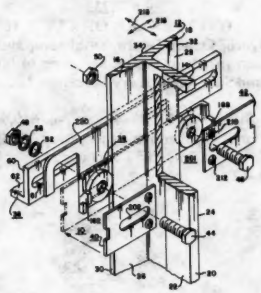
Herman S. Karol, Bricktown, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 5, 1984, Ser. No. 678,522
Int. Cl.[4] B66B *7/02*
U.S. Cl. 187—95 5 Claims

1. In a guide rail clamping assembly for fixing rail clips to an elevator guide rail while facilitating both fore-aft and between guide (B.G.) adjustment of the guide rail relative to a support structure, including a first mounting member adapted to be fastened to the support structure and which defines an elongated opening, a second mounting member adjacent to the first mounting member having first and second tapped openings aligned with the elongated opening of the first mounting member, first and second rail clip members for engaging the flanges of a guide rail, with each rail clip member having first and second ends, and an opening intermediate its ends aligned with a tapped opening of the second mounting member, first and second bolts extending through the openings in the first and second rail clip members, respectively, and engaging the first and second tapped openings, respectively, in the second mounting member, to enable the flanges of the guide rail to be tightly clamped and locked by the first ends of the rail clips

against the second mounting member, with the first and second bolts further extending through the elongated opening in the first mounting member, permitting fore-aft and B.G. adjustment of the guide rail section relative to the first mounting member without releasing said lock, and first and second nuts on the first and second bolts, respectively, for clamping the rail clip members, second mounting member and associated guide rail to the first mounting member, the improvement comprising:

said opening in each of the first and second rail clip members being elongated in a direction between its ends to enable lateral movement of each rail clip relative to its associated



bolt for receiving a guide rail, and including a notch in the second end of each rail clip,

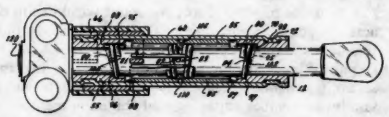
and first and second projections on the second mounting member, said first and second projections being adapted to extend into the elongated openings of the first and second rail clips, respectively, to orient, laterally guide and prevent rotation of the associated rail clip while it is being moved to receive a guide rail, said first and second projections extending into the notches at the second ends of the first and second rail clips, respectively, to orient and prevent rotation and retraction of the rail clips when they are in their clamping position relative to a guide rail.

4,577,730

MECHANICAL LOCK

Clyde R. Porter, Los Angeles, Calif., assignor to P. L. Porter Company, Woodland Hills, Calif.

Filed Aug. 30, 1983, Ser. No. 527,689
Int. Cl.[4] B65H *59/10*
U.S. Cl. 188—67 **22 Claims**



18. As an article of manufacture, an infinitely positionable mechanical lock comprising:

a housing;

at least one bushing fixed to said housing, said bushing having an inclined spring abutment surface;

a rod axially slidable through said least one bushing relative to said housing;

a coil spring on said rod, said coil spring having a normal inner diameter smaller than the diameter of said rod such that said coil spring normally grips said rod against translational motion within said housing,

pre-biasing means for normally biasing at least one coil of said coil spring against said inclined spring abutment surface and into locking engagement with said rod absent an axial load on said rod relative to said housing; and

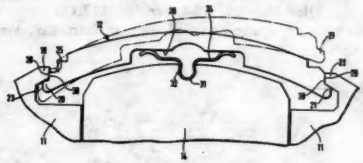
release means actuatable for partly unwinding said coil spring to release said rod for movement through said housing.

4,577,731

FLOATING CALIPER SPOT TYPE DISC BRAKE

Jochen Burgdorf, Offenbach-Rumpenheim, Fed. Rep. of Germany; Alfred Birkenbach, Rochester, Mich., and Ulrich Klimt, Gross-Umstadt, Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Continuation of Ser. No. 440,102, Nov. 8, 1982, abandoned. This application Dec. 27, 1984, Ser. No. 685,606
Claims priority, application Fed. Rep. of Germany, Dec. 16, 1981, 3149883
Int. Cl.[4] F16D *65/14*
U.S. Cl. 188—73.33 **8 Claims**



1. A floating-caliper spot-type disc brake for use in cooperation with a brake disc mounted on a support for rotation about a disc axis relative thereof, comprising

a pair of brake shoes;

means for supporting said brake shoes at opposite axial sides of the brake disc for movement substantially parallel to the disc axis toward and away from the disc, including a carrier member rigidly connected to the support at one of the axial sides of the brake disc and extending past the brake disc to the other axial side thereof;

means for moving said brake shoes at least toward the brake disc to frictionally engage the same, including a caliper member so mounted on said carrier member for displacement substantially parallel to the disc axis as to straddle the brake disc and having two extensions, one of said extensions protruding generally circumferentially outwardly from one end of said caliper and the second of said extensions protruding substantially circumferentially outwardly from an end of said caliper opposite said one end thereof, and an actuator including two relatively substantially axially displaceable elements arranged on the one axial side of the brake disc and one directly applying braking force to the closer one of said brake shoes while the other is rigid with said caliper member to transmit the braking force through the latter to the other of said brake shoes;

means for guiding said caliper member on said carrier member for said displacement including means for bounding at least one substantially axially extending guiding opening in one of said members, and at least one substantially axially extending guiding pin secured to the other of said members and slidingly received in said guiding opening;

abutment means on said carrier member for said caliper member, including two abutments on said carrier member, one of said abutments extending substantially circumferentially inwardly from one end of said carrier defining a first cut-out radially inwardly of said one abutment, and the second abutment extending circumferentially inwardly from an end of said carrier opposite said one end thereof defining a second cut-out radially inwardly of said second abutment;

means for resiliently urging said caliper member outwardly from the disc axis and generally radially of said axis into a mounted positon relative to said carrier member in which

said one and said second extensions are respectively in said one and said second cut-outs engaged radially outwardly and circumferentially against said abutments; and

said one and said second abutments and said one and said second cut-outs are dimensioned to receive the respective said one and said second extensions of said caliper member so that said caliper member may be moved against the urging of said resilient means into an assembling position in which one of said caliper member extensions is received in one of said cut-outs and said second extension is free to move substantially radially out of said second cut-out past said second abutment.

4,577,732

BRAKE APPARATUS TO RETARD RELATIVE MOVEMENT BETWEEN TWO MEMBERS

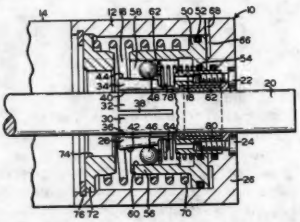
Helmut Gottling, Isernhagen, Fed. Rep. of Germany, assignor to WABCO Westinghouse Steuerungstechnik GmbH, Hanover, Fed. Rep. of Germany

Filed May 21, 1984, Ser. No. 612,113

Claims priority, application Fed. Rep. of Germany, May 26, 1983, 3319042

Int. Cl.[4] F15B *15/26*

U.S. Cl. 188—67 **18 Claims**



1. A brake apparatus for retarding relative movement between a movable member and a second member, said apparatus comprising:

(a) a housing positioned around the perimeter of at least a portion of one of such members;

(b) a collar fixedly secured to said housing generally around said perimeter of at least a portion of one of such members;

(c) at least two clamping elements fixedly secured to said collar, said clamping elements each having a respective first surface positioned generally coaxial with and a predetermined distance from at least one of such members, each of said clamping elements being flexible and radially movable to frictionally engage one of such members with said respective first surface to thereby apply a braking force, said clamping elements each having a respective second surface generally radially opposite said respective first surface;

(d) at least two ball means within said housing, one of said ball means arranged in abutting engagement and longitudinal rolling relationship with a respective said second surface of one of said clamping elements and a second of said ball means arranged in abutting engagement and longitudinal rolling relationship with a respective second surface of a second of said clamping elements for urging said clamping elements into frictional engagement with said one of such members when said ball means longitudinally rolls along each of said a respective second surface in a first longitudinal direction;

(e) an actuating means disposed within said housing and in coaxial alignment with at least a portion of said clamping elements for imparting rotational movement to said ball means, said actuating means having a third surface spaced from said each of said a respective second surface and arranged in abutting engagement and longitudinal rolling relationship with said ball means in said first longitudinal direction;

(f) an urging means positioned between and coaxial with each of such members and in abutting engagement with said ball means for urging said ball means in said first longitudinal direction; and

(g) at least one of said second and said third surfaces having a preselected inclined with respect to the longitudinal axis of said at least one of such members such that the radial distance between said second and said third surfaces decreases in said first longitudinal direction.

4,577,733

DRUM BRAKE OR CLUTCH

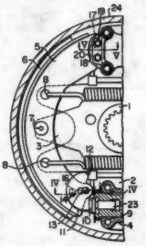
Tadayuki Oguro, Oobu; Teturo Yoshimoto, and Hazime Niki, both of Nagoya, all of Japan, assignors to Nisshin Spinning Co., Ltd. and Sumitomo Heavy Industries Ltd., both of Tokyo, Japan

Filed May 31, 1984, Ser. No. 615,648

Claims priority, application Japan, May 31, 1983, 58-96661

Int. Cl.[4] F16D *65/24*

U.S. Cl. 188—217 **2 Claims**



1. A torque-transmitting friction device comprising:

(a) a fixing member;

(b) a drum adapted to be rotatable relative to said fixing member;

(c) a pair of actuating devices attached to said fixing member in point symmetry with each other with respect to the center of said drum, said actuating device having a primary bore blanked at one end;

(d) a pair of abutment members projecting from said fixing member inward of said actuating devices;

(e) a pair of arcuate shoes disposed within said drum adjacent to the inner surface of said drum;

(f) one or more return springs acting to separate each of said shoes from said drum;

(g) an actuator piston slidably mounted within each of said actuating devices carrying an abutment surface adjustably retained within said piston; and

(h) a pair of lever members, each pivotally attached to a pin securely attached to one end portion of each of said shoes, said lever member engaging said abutment member at one end and said actuator abutment surface at the opposite end, said lever member being located upon said shoe by a bolt and nut means carried in a slot in said shoe.

4,577,734

BRAKE DRUM

Richard J. Williams, Kenton, Ohio, assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Jan. 20, 1984, Ser. No. 572,274

Int. Cl.[4] F16D *65/10*

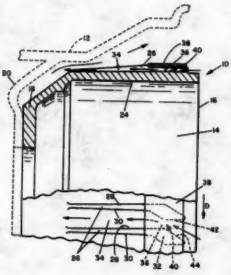
U.S. Cl. 188—218 R **3 Claims**

1. A brake drum comprising:

(a) a cylindrical braking drum including a flanged end and an open end;

(b) a plurality of generally axially extending fins spaced around the exterior surface of the braking drum, with the profiles of the fins being devoid of any portion thereof which overlap in an axial direction;

(c) each of the fins including radially extending side walls which diverge along a length thereof from the open end to provide a widest distance therebetween at a predetermined location from the open end and converge along the length thereof from the predetermined location to the flanged end, wherein adjacent side walls of adjacent fins collectively defining a space therebetween having its narrowest portion at the predetermined location;



(d) the brake drum being intended for rotation in a given direction and wherein the side walls of each fin diverging from the open end to the predetermined location including a first portion extending axially of the drum and facing towards the direction of rotation, and a second portion inclined from the open end to the predetermined location and facing away from the direction of rotation; and

(e) a steel band secured to and encircling the braking drum at the predetermined location, the steel band cooperating with the adjacent side walls and the exterior surface of the braking drum to define a venturi-shaped cooling air channel at the narrowest portion of each of the spaces.

4,577,735

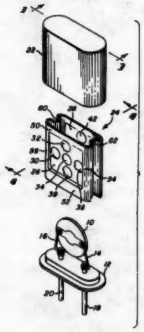
SHOCK ABSORBER FOR QUARTZ CRYSTAL ENCLOSURES USING MULTIPLE CONTACT POINTS TO DISTRIBUTE STRESS

Charles W. Mooney, Lake Worth; Robert E. Phipps, Pompano Beach, and William J. Kuznicki, Coral Springs, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 2, 1984, Ser. No. 627,248

Int. Cl.[4] F16F *7/00*

U.S. Cl. 188—268 **6 Claims**



1. A shock absorbing mechanism for protection of a planar crystal device against impact with a crystal enclosure wall, said crystal device having opposed major surfaces, said shock absorbing mechanism comprising:

shock absorbing means having a plurality of deformable protuberances for contacting one as said major surfaces when said crystal device is subjected to mechanical shock; and

carrier means for holding said shock absorbing means between one of said major surfaces and said enclosure wall so that said plurality of deformable protuberances contact one of said opposed major surfaces substantially simultaneously when said crystal device is shocked by a force exceeding a predetermined magnitude in a direction toward said shock absorbing means and substantially perpendicular to said opposed major surfaces.

4,577,736

TUBULAR MEMBER, ESPECIALLY FOR A SAFETY STEERING COLUMN FOR MOTOR VEHICLES

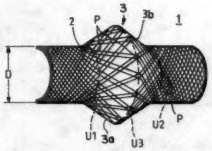
Bernd Bongers, Kirchheim, and Horst Bansemir, Munich, both of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed May 21, 1984, Ser. No. 612,139

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1983, 3321197

Int. Cl.[4] F16F *7/12*

U.S. Cl. 188—371 **4 Claims**



1. A tubular member having a longitudinal axis, especially for a safety steering column for motor vehicles, made of wound fiber-reinforced material strands with a fiber winding angle of essentially ±45° to said longitudinal axis for transmitting a defined torque load and a defined axial load through said tubular member, comprising at least one outwardly bulging section (3) intermediate end portions of said tubular member (1), said outwardly bulging section (3) having a diameter larger than a diameter of said end portions and extending around the entire circumference of the tubular member (1), said outwardly bulging section comprising fiber strands also wound at a winding angle of ±45° relative to said longitudinal axis and so that a spacing between neighboring crossing junctions of fiber strands increases from said diameter of said end portions to said larger diameter, and wherein said fiber strands form said crossing junctions (P) at least where said outwardly bulging section (3) has its largest diameter and where said outwardly bulging section (3) merges into said tubular member, namely at circumferential sites (U1, U2, U3) of largest bending in said fibers.

4,577,737

LOCK-UP TORQUE CONVERTER AND METHOD FOR CONTROLLING CLUTCH SLIP IN LOCK-UP TORQUE CONVERTER

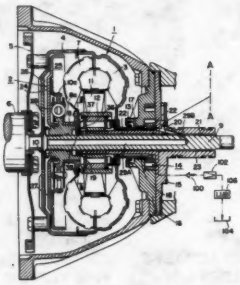
Yasuhiro Niikura; Yoshiro Morimoto; Hideo Hamada, all of Yokosuka; Masaaki Suga, and Takashi Murasugi, both of Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Aug. 1, 1983, Ser. No. 518,915

Claims priority, application Japan, Aug. 2, 1982, 57-134900; Aug. 2, 1982, 57-134901

Int. Cl.[4] F16D *47/06*; G01L *3/02*

U.S. Cl. 192—0.032 14 Claims



3. A lock-up torque converter associated with a prime mover, comprising:

a torque converter including a stationary sleeve, an input shell driven by a prime mover, a pump impeller secured to said input shell and cooperating therewith to form an enclosed fluid space, a turbine runner disposed in said enclosed fluid space between said input shell and said pump impeller and cooperating with said pump impeller to form a toroidal fluid circuit, and an output hub connected to said turbine runner;

a fluid operated friction clutch disposed between said turbine runner and said input shell to define an engagement chamber between said fluid operated clutch and said turbine runner, a disengagement chamber between said fluid operated clutch and said input shell, and a plurality of spring means for providing a drive torque transmitting connection between said turbine runner and said output hub;

a torque sensor means for measuring an actual value of torque transmission from said turbine runner to said output hub and generating a sensor output signal indicative of said actual value of torque transmission;

means for detecting an operating state of said prime mover when said prime mover is operating;

means for determining a desired value of torque transmission from said turbine runner to said output hub in response to the detected operating state of the prime mover and generating a desired signal indicative of said desired value of torque transmission; and

control means for controlling an engaging fluid pressure provided to said fluid operated clutch so as to control slip in said fluid operated clutch in such a manner as to adjust said actual value of torque transmission toward said desired value of torque transmission.

4,577,738

DRIVE SYSTEM WITH OIL SHEAR CLUTCH-BRAKE UNIT

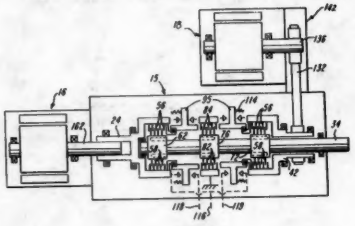
Jerry L. Yater, Hamilton, Ohio, assignor to Force Control Industries, Inc., Fairfield, Ohio

Filed Jul. 6, 1984, Ser. No. 628,405

The portion of the term of this patent subsequent to Jul. 10, 2001, has been disclaimed.

Int. Cl.[4] B60K *41/24*

U.S. Cl. 192—18 A 13 Claims



1. A drive system adapted for use in providing a high speed reversible or multiple speed drive for a machine, said system comprising an oil shear clutch-brake unit including a housing containing a supply of oil, a first input shaft and an output shaft supported by said housing for rotation on an axis, an annular second input shaft supported by said housing for rotation on the axis of said first input shaft and said output shaft, a first annular clutch within said housing and including means for selectively connecting said first input shaft to said output shaft, a second annular clutch within said housing and including means for selectively connecting said second input shaft to said output shaft, an annular brake within said housing and including means for selectively braking said output shaft relative to said housing, annular actuating means within said housing for axial movement between first and second clutch engaging positions and a brake engaging position, means for driving said first and second input shafts, means for recirculating oil within said housing and radially outwardly within each of said annular clutches and radially outwardly within said annular brake, and means for moving said annular actuating means selectively between said clutch engaging positions and said brake engaging position.

4,577,739

HYDROSTATIC CLUTCH

Ivan J. Cyphelly, Gran Canaria, Spain, assignor to Glycoantriebstechnik GmbH, Wiesbaden, Fed. Rep. of Germany

Filed Dec. 5, 1983, Ser. No. 558,164

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1982, 3244980

Int. Cl.[4] F16D *31/04*

U.S. Cl. 192—61 12 Claims

1. In a hydrostatic clutch which comprises:

a clutch housing;

a drive shaft extending into said housing and rotatable about an axis therein;

an output shaft extending into said housing;

a casing rotatable in said housing about said axis and connected to one of said shafts;

a positive displacement gear pump in said casing connecting to the other of said shafts;

an intake compartment formed in said housing at one side of said casing;

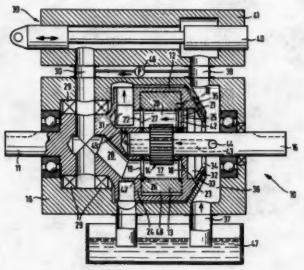
means in said casing defining a flow path from said compartment through said pump; and

a throttle valve for controlling the flow of fluid along said path, the improvement wherein:

said pump is formed with a pump body having an intake passage and a pressure passage;

said casing is formed with openings communicating with said passages to define said path; and

said casing and said body are formed with means enabling relative rotation of said body and said casing through an angle less than a full rotation whereby said passages are functionally reversed to enable switchover in the rotational sense of the output shaft upon reversal of the rotational sense of the input shaft, said casing being



fixed on said input shaft and said output shaft being connected to gears cooperating with said body to form said pump, said pump having an upstream side in the region of said output shaft and said casing having a downstream side turned toward said input shaft, said casing defining with said output shaft at said upstream side, an annular intake opening around said output shaft of the smallest possible cross section consistent with no significant increase in the flow resistance along said path.

4,577,740

CLUTCH COVER ASSEMBLY

Roger F. L. Carmillet, Paris, France, assignor to VALEO, Paris, France

Filed Jun. 15, 1983, Ser. No. 504,397

Claims priority, application France, Jun. 21, 1982, 82 10785

Int. Cl.[4] F16D *13/18*

U.S. Cl. 192—70.18 **32 Claims**

1. A clutch cover assembly comprising an axially fixed part, an axially movable part, means mounting said axially movable part for axial movement relative to said axially fixed part and for rotational movement with said axially fixed part, elastic means for urging said axially movable part toward a storage position, means for limiting axial movement of said axially movable part and for retaining said axially movable part in the radial direction, said mean for limiting and for retaining defining the storage position for said axially movable part comprising at least one retaining member carried by a first of said parts and at least one limiting member carried by a second of said parts, said limiting and retaining members being out of frictional contact in the operative position of said clutch cover assembly, said limiting member having at least one surface inclined relative to the axial direction and said retaining member having at least an edge engageable with said inclined surface in the storage position to prevent the movement of said axially movable part in the radial and axial directions.

4,577,741

FLUID-OPERATED SERVOMOTOR FOR ACTUATION OF CLUTCHES OR THE LIKE

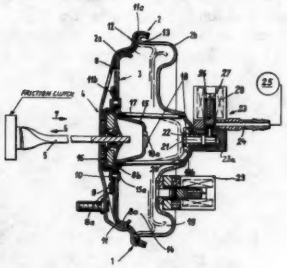
Christoph Schmid, Wooster, Ohio, assignor to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Filed Feb. 9, 1983, Ser. No. 465,266

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1982, 3205155

Int. Cl.[4] F16D *25/08*; F15B *13/04*

U.S. Cl. 192—85 V **16 Claims**



1. A fluid-operated servomotor for actuation of clutches in automotive vehicles or the like, comprising a prime mover including a first component constituting a cylinder and a second component constituting a piston reciprocable in said cylinder between first and second end positions and defining with the cylinder a chamber whose volume changes in response to movement of said piston between said end positions; means for yieldably urging said piston to one of said end positions; means for moving said piston to the other of said end positions, including means for establishing a pressure differential between said chamber and the atmosphere, said pressure differential establishing means including a device for maintaining a body of air at a given pressure and means defining a path for the flow of fluid between said device and said chamber; and a valve for sealing said path in response to movement of said piston to said other end position, said valve including a first portion comprising a valving element provided on and movable with said piston and a second portion comprising a seat provided on said cylinder and sealingly engaged by said valving element in said other end position of said piston so that the chamber is then sealed from said device, the pressure in said chamber deviating from said given pressure in said other end position of said piston.

4,577,742

CLUTCH DISC

Chiaki Saida, Tokoname, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Apr. 22, 1983, Ser. No. 487,681

Claims priority, application Japan, Apr. 27, 1982, 57-70684; May 21, 1982, 57-84926

Int. Cl.[4] F16D *3/14*

U.S. Cl. 192—106.2 **13 Claims**

1. In a clutch disc in which a clutch hub having a hub flange

comes into rotating engagement with a disc plate through damping means and friction means, a clutch disc including:

said hub flange comprising an inner flange portion and an outer flange portion mounted to be relatively rotatable by a given angle with respect to said inner flange portion and with an angular clearance;

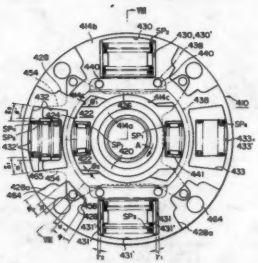
at least one plate fixed to said outer flange portion so as to limit the axial relative movement between said inner and outer flange portions;

first damping means arranged operatively between said inner and outer flange portions through said fixed plate and designed to be resiliently compressed during relative angular displacement between said inner and outer flange portions;

a first friction means disposed between said fixed plate and one of said inner and outer flange portions operatively associated with said inner and outer flange portions;

at least one disc plate adapted to be relatively rotatable with respect to said outer flange portion and provided with a facing member on the disc plate outer periphery;

second and third damping means arranged operatively between said disc plate and said outer flange portion, said second and third damping means being designed to be resiliently compressed during relative angular displacement between said disc plate and said outer flange portion;



second and third friction means arranged between said fixed plate and said disc plate and acting between said outer flange portion and said disc plate;

a control plate interposed between said fixed plate and said disc plate for determination of a point of commencement of action of said third friction means; and

a resilient control means disposed to control the angular position of said control plate relative to said outer flange portion so as to maintain a predetermined angular position of said control plate relative to said outer flange portion during a predetermined relative rotation angle (α) between said outer and inner flange portions;

said resilient control means being constructed and disposed so that it takes substantially no part in torque transmittance; and

an outer periphery of said control plate being capable of engaging its said outer flange portion with a given angular clearance corresponding to said predetermined angle (α), and circumferentially engaging said resilient control means adapted to engage circumferentially within a window provided in said disc plate and to loosely and circumferentially fit in an associated window provided in said outer flange portion with an angular clearance corresponding to said predetermined angle (α).

4,577,743

CLUTCH DISC FOR A MOTOR VEHICLE FRICTION CLUTCH

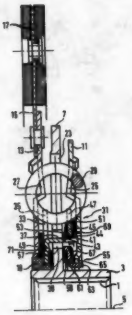
Harald Raab, Schweinfurt, and Hilmar Göbel, Grafenrheinfeld, both of Fed. Rep. of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Aug. 9, 1984, Ser. No. 639,353

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1983, 3330343

Int. Cl.[4] F16D *3/14*

U.S. Cl. 192—106.2 **6 Claims**



1. In a clutch disc for a motor vehicle friction clutch comprising:

(a) a hub which defines a rotation axis of the clutch disc and carries a radially protruding hub disc,

(b) two side discs arranged on axially opposite sides of the hub disc and being firmly connected with one another and mounted rotatably as a unit through a limited angle of rotation on the hub in relation to the hub disc about the rotation axis,

(c)clutch friction linings fixedly connected with one of the side discs,

(d) a plurality of damping springs retained in windows of the hub disc and the side discs and stressable on relative rotation of the hub disc and the side discs,

(e) an under-load friction damper device dimensioned for operation under load,

with two annular control discs rotatable through a limited angle of rotation in relation to the hub disc and the side discs and co-operating with at least one of the damping springs, a first one of the two control discs being arranged axially between the hub disc and a first one of the two side discs, said first control disc being provided with several tabs staggered in the circumferential direction and passing axially through openings of the hub disc and a second one of the two control discs being arranged axially between the hub disc and a second one of the two side discs, said second control disc being arranged substantially radially outside the diameter defined by the tabs and being guided non-rotatably but axially displaceably on the tabs of the first control disc,

with a first friction ring arranged axially between the first control disc and the first side disc,

with a second friction ring clamped axially in between the second control disc and the second side disc and with an axially acting first spring of annular disc form which is arranged axially between the hub disc and the second of the two side discs and is stressed in the axial direction between the tabs of the first control disc and the second side disc, said first spring being arranged axially between the hub disc and the second control disc and supported with its internal circumference on the tabs and with its external circumference on the second control disc, and

(f) an idling friction damper device dimensioned for idling operation with a third friction ring arranged axially be-

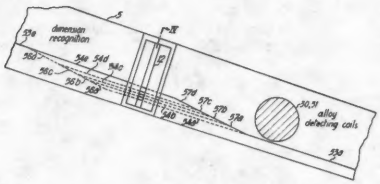
tween one of the two side discs and the hub disc and an axially acting second spring stressed in axially between the other of the two side discs and the hub disc, in each case radially within the diameter radially defined by the tabs of the first control disc.

4,577,744

MULTICOIN DISCRIMINATOR

Joël Doucet, 15, rue Roger Salengro, 92130 Issy-les-Moulineaux, France

Filed Oct. 27, 1982, Ser. No. 437,145
Claims priority, application France, Oct. 27, 1981, 81 20170
Int. Cl.⁴ G07F 3/02
U.S. Cl. 194—318 **51 Claims**



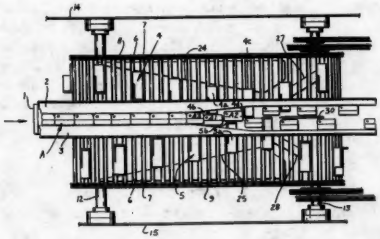
1. A multicoin discriminator comprising a chute having a vertically inclined track on which coins roll, and an inclined side wall against which one face of said coins rests as the coins roll on the inclined track, and means including photoreceptive means and photoemissive means on opposite sides of said chute for detecting the dimensions of said coins, said chute track in front of said dimension detecting means having a cross-section transverse to the direction the coin rolls along the inclined track, the cross-section being shaped as a staircase having plural steps each having a riser and landing, the spacings between the inclined wall and each riser being approximately equal to the thicknesses of acceptable coins, the spacings between adjacent landings being approximately equal to the difference in radii of acceptable coins, the landing of the lowest step abutting against the inclined wall.

4,577,745

APPARATUS FOR ARRANGING ARTICLES IN GROUPS

Rodney K. Calvert, Dunwoody, and Alton J. Fishback, Austell, both of Ga., assignors to The Mead Corporation, Dayton, Ohio

Continuation of Ser. No. 475,522, Mar. 15, 1983, abandoned. This application Jan. 28, 1985, Ser. No. 695,413
Int. Cl.⁴ B65G 47/26
U.S. Cl. 198—420 **3 Claims**



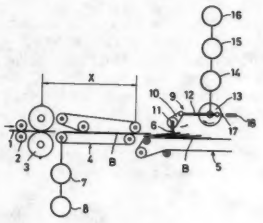
1. Apparatus for arranging articles in two laterally spaced streams from a single stream comprising conveyor means for carrying said articles, endless means on each side of the conveyor having longitudinally spaced pushers which are laterally movable relative to the conveyor, said pushers having a longitudinally extending surface and a laterally extending trailing surface, drive means to drive the endless means slower than the conveyor in the longitudinal direction, means to move laterally the pushers into contact with the lateral side of the articles, said pushers being positioned longitudinally relative to the articles on the conveyor to initially contact only a portion of the lateral side of the article which is longitudinally spaced downstream of the trailing side of the article and the trailing surface of said pusher being longitudinally spaced downstream from the leading side of the following article to prevent contact between said following article and said trailing side of said pusher as the article is being laterally moved to prevent rotary movement of said following article, the speed difference between the pushers and the conveyor causing the articles to move longitudinally relative to said pushers and to eventually contact the trailing surface of the next downstream pusher after substantial lateral movement of said article, fixed stabilizing means for preventing rotation of the articles as said pushers are laterally withdrawn relative to said conveyor.

4,577,746

CONTROL SYSTEM FOR BLANK PRESSER

Masateru Tokuno, Hyogo; Tetsuya Sawada, Kyoto, and Yasuharu Mori, Hyogo, all of Japan, assignors to Rengo Co., Ltd., Osaka, Japan

Continuation of Ser. No. 399,134, Jul. 16, 1982, abandoned. This application Mar. 18, 1985, Ser. No. 712,475
Claims priority, application Japan, Nov. 20, 1981, 56-114543; Jul. 2, 1982, 57-115905
Int. Cl.⁴ B65G 47/31
U.S. Cl. 198—462 **2 Claims**



1. In a system having a conveyor and an upstream conveyor and a blank presser above said conveyor used to press each of the blanks fed one after another from said upstream conveyor and a control system for controlling the blank presser, the improvement comprising:

a setting means for setting a value (L) proportional to the length of the blanks fed from said upstream conveyor and a value (l) proportional to the distance by which said blank presser moves in one cycle of its operation;

a means for generating a signal (ϕ_A) proportional to the speed at which said blanks are fed;

a means for generating a signal (ϕ_B) proportional to the speed of said blank presser;

a counter which starts to count the signal (ϕ_A) upon the arrival of a blank at said upstream conveyor and generates a timing signal (T) when its counter becomes equal to a value (X) representing the effective length of said upstream conveyor;

a divider for making a division (l/L) and generating a result of the division in response to the timing signal (T);

a multiplier for multiplying the result of the division (l/L) by the signal ϕ_A;

a computing means for the performing a computation expressed by $l/L \times \phi_A - \phi_B$;

a first converting means for generating a reference voltage (V_A) proportional to the result of said division;

a second converter for generating an error voltage (V_C) proportional to the result of said computation;

an operational amplifier for combining said reference voltage (V_A) and said error voltage (C_C); and

a means for controlling a drive for said blank presser by use of the combined voltage so that the blanks will be held down by said blank presser at a correct timing.

4,577,747

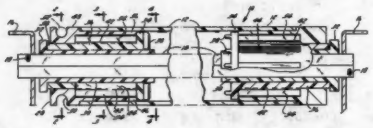
CONVEYOR ROLLER AND BEARING ASSEMBLY

Donald E. Martin, Waukesha, Wis., assignor to Rexnord Inc., Brookfield, Wis.

Filed Feb. 28, 1985, Ser. No. 706,698

Int. Cl.[4] B65G *45/02*

U.S. Cl. 198—500 13 Claims



1. A conveyor roller and bearing arrangement adapted for rotary movement about a stationary axle fixedly secured between spaced, side-support frame rails comprising:

a hollow cylindrical roller having two open ends;

a pair of bearing assemblies mounted in the ends of said roller, each bearing assembly having

a hollow, inner bearing race surrounding and keyed to said axle to prevent rotation about but permit sliding movement along said axle, said inner bearing race having an annular flange lying outside the end of said roller;

a hollow, outer bearing race rotatably mounted on said inner bearing race and having an annular flange positioned radially inwardly of said roller, said flange being provided with a plurality of cooling fins; and

a hollow outer cushioning sleeve secured within the end of said roller and to said outer bearing race, said sleeve being constructed and arranged to maintain axial bearing contact between said inner and outer bearing races upon misalignment of said roller and axle due to uneven loading thereon.

4,577,748

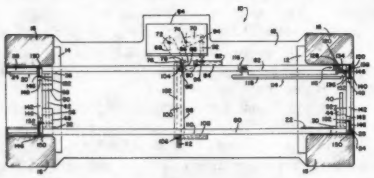
PRESS MOUNTED TRANSFER APPARATUS

Gregory J. Boegner, Baltimore; Harry J. Walters, Fallston, and Robert L. Marshner, Timonium, all of Md., assignors to M. S. Willett, Inc., Cockeysville, Md.

Filed Sep. 30, 1982, Ser. No. 431,418

Int. Cl.[4] B65G *25/00*

U.S. Cl. 198—621 23 Claims



1. Transfer apparatus comprising a base for mounting on a press bed, longitudinal rail means attached to the base for supporting the transfer apparatus on the base, longitudinal slide means mounted on the longitudinal rail means for moving forward and rearward in longitudinal directions with respect to the base, transverse rail means mounted on the longitudinal slide means, transverse slide means mounted on the transverse rail means for moving transversely in and out on the transverse rail means with respect to the base, first and second longitudinal transfer bars connected to the transverse slide means for moving transversely with the transverse slide means, longitudinal drive means connected to one of the transfer bars for driving the transfer bars longitudinally forward and rearward, transverse drive means connected to the first transfer bar for driving the transfer bar transversely in and out, and a transverse rod having a first end connected to the transverse drive means and a second end connected to the second transfer bar for imparting coordinated transverse in and out movement to the second transfer bar.

4,577,749

FRICTIONAL DRIVE MEANS AND METHOD FOR DRIVING FRICTIONAL ROLLERS

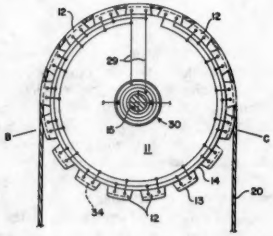
Gerald R. O. Pentith, Sturgis, Ky., assignor to Continental Conveyor & Equipment Co., Inc., Winfield, Ala.

Filed Jun. 27, 1984, Ser. No. 625,059

Claims priority, application United Kingdom, Jul. 1, 1983, 8317922

Int. Cl.[4] B65G *39/08*

U.S. Cl. 198—805 12 Claims



1. In a friction roller having an outer friction surface and an inner surface and including a bearing surface, the improvement comprising:

(a) a plurality of arcuate sections positioned upon and surroundingly affixed to the friction roller, each arcuate section having at least one channel positioned upon an arcuate section surface obverse to the internal surface of the friction roller;

(b) the channel being configured to receive a rope having magnetic properties, similar channels on adjacent arcuate sections being aligned for smooth transitional transmittal of the rope from one arcuate section to the next;

(c) the friction roller including means for transferring electrical current to the arcuate sections; and

(d) the arcuate sections including: (i) an electromagnetic field generating coil embeddedly positioned beneath the channel, a longitudinal axis of the coil arranged in parallel relationship with a longitudinal axis of the channel; (ii) means for sensing the proximity of the rope to the channel on a particular arcuate section and for transmitting an electrical current through the coil of the particular arcuate section when the rope is in contact with the particular arcuate section.

4,577,750

IMPREGNABLE LOCKING SYSTEM

Gilbert Bennardo, Nice, France, assignor to S.A.M. Microtechnic, Monaco

Filed Jul. 15, 1985, Ser. No. 755,149

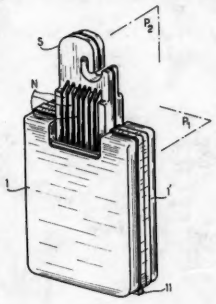
Claims priority, application France, Dec. 11, 1984, 84 19035

Int. Cl.[4] A45C *13/10*

U.S. Cl. 206—1.5 7 Claims

1. Impregnable locking system of the fastening of displayboxes called "blisters", consisting in a box in two articulated halves having on the side opposite their hinge fastening flaps destined to be held one against the other by this system,

characterized in that it consists in a clip destined to cover these two flaps, and between which is attached a transversal shaft; a vertical notch made in the flaps allowing this shaft to go through when the clip is put into place, two gears being slid onto this shaft, between the outer side of each flap and the corresponding side of the clip, the means being provided so



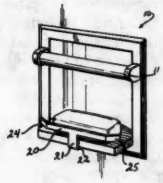
that these gears are constantly pushed towards each other, and once this clip placed on the flaps, the gears come to rest in the lodgings made in the outer sides of the flaps therefore immobilizing the clip onto the flaps, external means being provided to push the gears in the opposite direction to take them out of the lodgings to allow the extraction of the clip and to free the flaps of the blister to allow its opening.

4,577,751

RETAINER FOR SOAP DISH

Jean St-Jacques, R.R. #2 Cregheur Rd., Luskville, Quebec, Canada J0X 2G0

Filed Aug. 24, 1984, Ser. No. 643,986
Claims priority, application Canada, Apr. 19, 1984, 452386
Int. Cl.[4] A47K *5/00*
U.S. Cl. 206—77.1 **15 Claims**



1. A soap stop attachment for use with a soap tray or dish of the type which is attached to a vertical surface and has an inclined soap-receiving surface, said soap stop comprising:

a horizontally disposed, elongated stop arm adapted to be disposed in a soap-retaining position in front of and above the edge of said soap-receiving surface, said stop arm extending substantially completely across the width of said soap-receiving surface so as to retain a bar of soap thereon; and

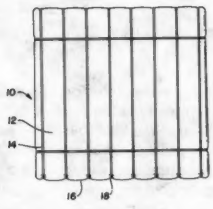
a retaining means connected to said stop arm and adapted to contact said soap tray for attachment thereto to secure said stop arm in said soap-receiving position.

4,577,752

HIGH DENSITY TOW BALE AND METHOD FOR FORMING IT

Thomas D. Meredith, Jr., Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 4, 1984, Ser. No. 607,049
Int. Cl.[4] B65D *71/00*
U.S. Cl. 206—83.5 **4 Claims**



1. A bale in which filamentary tow such as filter tow has been compressed by a tow baler and wrapped with a cardboard or the like covering and held in compressed condition by multiple strappings which extend around the wrapped bale in different directions at right angles with respect to each other; said bale characterized by its bottom and the filamentary tow that is adjacent the covering at the bottom of the bale having embossed therein a pattern of multiple pads and unrelieved areas between the pads, said unrelieved areas adapted to receive said strappings and said pads adapted to make contact with the floor while the bale is seated thereon for opening and thereby enable the strappings to be readily slidably removed from the bottom of the bale.

4,577,753

SEALED MESSAGE CARRIER

Joseph Marhal, 3567 E. Fitzsimmons Rd., Oak Creek, Wis. 53154

Filed Sep. 27, 1984, Ser. No. 654,894
Int. Cl.[4] B65D *85/46*
U.S. Cl. 206—232 **5 Claims**

1. A message carrier comprising

a container having a movable top and a bottom, said bottom have a small opening therein,

a tubular message holder for holding a rolled up message, said holder being adapted to be inserted into said container through said opening in the bottom of the container

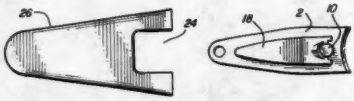
means removably positioned in said container for holding the message holder on insertion through the opening on the bottom of the container, said holding means comprising a teddy bear having a pair of arms for supporting said holder, and means for sealing the opening in the bottom of the container whereby on removal of the top of the container the message holder will be carried by the holding means.

4,577,754

NAIL CLIPPINGS RECEPTACLE

Joyce D. Jones, 9056 King Dr., Chicago, Ill. 60619

Filed Jan. 23, 1984, Ser. No. 573,151
Int. Cl.[4] A45C *11/26*
U.S. Cl. 206—349 5 Claims



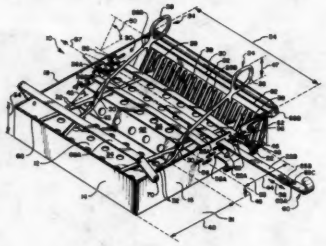
1. A nail clipping receptacle for use with a nail clipper having a pair of opposed blades, each of said blades having a cutting edge opposed to the other cutting edge, a pin extending through the blades, and a lever connected to the pin for selectively moving the cutting edges toward each other for cutting nails; said receptacle comprising a pouch having a continuous top, and a continuous bottom, said top having a plurality of top edges, said bottom having a plurality of bottom edges defining a shape similar to a shape defined by the top edges, said top edges being sealingly fixed to like bottom edges to form continuous edges of the pouch, said pouch having an opening for receiving said nail clipper, said opening extending into the top, said nail clipper positionable in the opening with the cutting edges of the clipper being substantially aligned with a junction of the top and the bottom to allow positioning of a nail between the cutting edges for cutting the nail.

4,577,755

SURGICAL INSTRUMENT TRAY

Mitchell Ramsay, 5948 S. Suwannee Cir., Salt Lake City, Utah 84107

Filed Feb. 22, 1984, Ser. No. 582,385
Int. Cl.[4] B65D *83/10*
U.S. Cl. 206—370 17 Claims



1. A surgical instrument tray comprising:

a base member;

first and second opposite side members each affixed to said base and extending away therefrom to form an area therebetween for the placement of surgical instruments, each of said instruments having movable lever members which are movable with respect to one another about a pivot;

a plurality of apertures formed in each of the side members wherein some of the apertures in the first side member are substantially opposite some of the apertures in the second side member;

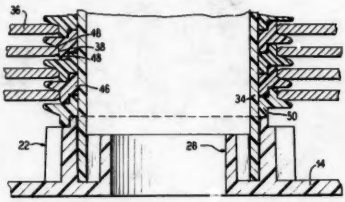
retaining members each sized to extend through an aperture in said first side member to and through an aperture in said second side member, said retaining members being removably and selectively positionable through said apertures and against said movable lever members of said surgical instrument to retain said surgical instruments with said movable lever members in a predetermined orientation within said area.

4,577,756

PROTECTIVE CANISTER FOR COMPUTER DISCS

Michael P. Hennessy, 1359 Portsmouth Ct., Carol Stream, Ill. 60788, and Andrew B. Prueher, 1016 Sheridan Rd., Highland Park, Ill. 60035

Filed Apr. 26, 1984, Ser. No. 604,169
Int. Cl.[4] B65D *85/30, 45/18*
U.S. Cl. 206—444 8 Claims



1. A protective canister for protecting a plurality of computer discs of the type having a pair of opposite main surfaces, a central aperture and a pair of bevel surfaces each extending from a respective main surface into the central aperture, said canister comprising:

a hollow tube including two ends;

a pair of caps for closing said two ends;

cooperable latch means on said two ends and on said caps for securing said caps to said ends;

a post and post mounting means carried by said caps for holding said post centrally within said hollow tube, said post including a cross-sectional dimension slightly smaller than that of the aperture of a disc to receive the discs thereover in a stack;

a platform on each of said caps about said post;

a plurality of spacer rings for placement over said post between adjacent discs in the stack and between each end disc of the stack and the respective platform, each of said rings comprising a ring body and a plurality of arcuate projections extending from each side of said ring body, each of said arcuate projections being generally L-shaped as viewed in the radial direction including a first leg for extending into and engaging the inner diameter of the central aperture and a second leg carrying a support surface for engaging a respective bevel surface; and

said hollow tube and said post including lengths such that the stack of computer discs is clamped against movement when said caps are latched to said hollow tube.

4. In a protective package for protecting computer discs having opposite main surfaces, a central aperture and a pair of bevel surfaces extending from the main surfaces into the central aperture, in which spacer rings are alternately positioned between the discs to form a stack positioned by a central post through the rings and discs and mounted within a container by a pair of n structures, the improvement wherein:

each of said rings comprises at least one surface on each side thereof for engaging only the bevel surface of a respective disc;

each of said rings comprises a ring body and a plurality of arcuate projections extending from each side of said ring body; and

each of said arcuate projections being generally L-shaped as viewed in radial section and including a first leg for extending into engagement with the inner diameter of the central aperture of a disc and a second leg carrying a support surface complemental to a bevel surface for engaging a bevel surface,

said support surface constituting said at least one surface on each side of the ring.

7. A spacer ring for receiving a post therethrough and spacing a pair of discs, each of the discs having a pair of main surfaces, a central aperture for receiving the post, and a pair of bevel surfaces each extending from a respective main surface into the central aperture, said spacer ring comprising:

a ring body; and

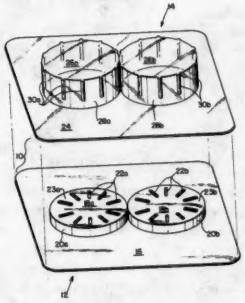
a plurality of arcuate projections extending from each side of said ring body,

each of said arcuate projections being generally L-shaped as viewed in radial section and including a first leg for extending into and into engagement with the inner diameter of a central aperture of a disc, and a second leg carrying a surface complemental to and for engaging a bevel surface of a disc.

4,577,757
GROOVED BASE PACKAGE

Gerald O. Hustad, McFarland; Ray H. Griesbach, Monona, and James Anderson, Madison, all of Wis., assignors to Oscar Mayer Foods Corporation, Madison, Wis.

Filed Aug. 20, 1984, Ser. No. 642,470
Int. Cl.[4] B65D *6/02*
U.S. Cl. 206—461 **13 Claims**



1. In a container for sliced meat products or the like comprising: (a) a base which is horizontal in use including a marginal base flange, a raised pedestal having a flat support surface upon which the product rests, and a short peripheral sidewall extending vertically from said marginal base flange to said pedestal around the periphery of said pedestal; and (b) a cover which is horizontal in use including a marginal cover flange shaped complementary to said marginal base flange, a raised top wall under which the product is located, and a long peripheral sidewall extending vertically from said marginal base flange to said top wall around the periphery of said top wall and provided with concave channels along the interior surface extending vertically from said marginal cover flange to said top wall; said short peripheral sidewall of said base being snugly received inside said long peripheral sidewall of said cover with said marginal base flange sealingly attached to said marginal cover flange, a space being provided between said pedestal and said top wall in which the product is located; the improvement wherein:

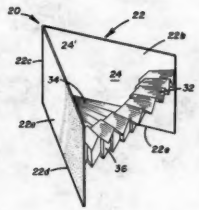
said concave channels terminate at a height above said marginal cover flange which is equal to or greater than the height of said short peripheral sidewall of said base such that after said short peripheral sidewall of said base is received inside said long peripheral sidewall of said cover, said concave channels terminate at or above said short peripheral sidewall; and

a plurality of depressions are provided in the flat support surface of said pedestal in which free liquids from the product are collected wherein said depressions are grooves which extend longitudinally away from an adjacent portion of said short peripheral sidewall said flat support surface being spaced above said marginal cover flange.

4,577,758
ASHTRAY

Patricia Gilda, 6 Hermann Dr., Monterey, Calif. 93940; William F. Mann, 25 Main St., and Winthrop D. Allen, III, 25 Clawson St., both of Bisbee, Ariz. 85603

Filed May 17, 1985, Ser. No. 735,799
Int. Cl.[4] B65D *73/00*
U.S. Cl. 206—496 **12 Claims**



1. An ashtray comprising:

a folded member having a substantially V-shaped cross-section formed by two panels with a common side, the two panels forming two sides of the ashtray, two adjoining sides of the two panels contiguous to the common side adapted for contact with a supporting surface to support the two panels thereon in an upright position, said two sides defining the bottom side of the ashtray, said two panels defining an angular space there between, said angular space having an apical portion near the common side;

an upper member connected to the two panels for supporting cigarettes or cigars in substantially horizontal positions, said upper member being spaced apart from the common side to allow the lighted ends of cigarettes or cigars to protrude into the apical portion and to allow ashes from such lighted ends to fall through the apical portion towards the bottom side of the ashtray;

a lower member connected to the two panels to hold ashes and refuse, said lower member positioned to receive the ashes falling through the apical portion from the lighted ends of cigars or cigarettes supported on the upper member, said lower member being at a lower elevation than the upper member when the two panels are in the upright position; and

a side member connected to the two panels and the upper and lower members, the side and lower members being of such shape that they, together with the two panels, form a receptacle to securely contain any ash and refuse on the lower member, said two panels and the upper, lower and side members being made of or lined with a fire resistant material.

4,577,759
THREE-LEVEL STACKING CONTAINER

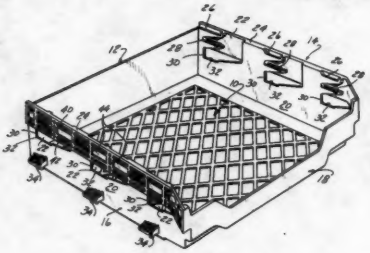
Elsmer W. Kreeger, Howell, Mich., assignor to Pinckney Molded Plastics, Inc., Howell, Mich.

Filed Jan. 18, 1985, Ser. No. 692,612
Int. Cl.[4] B65D *21/04*
U.S. Cl. 206—505 **3 Claims**

1. In a multilevel stacking container having a rectangular bottom, a pair of upwardly projecting sidewalls and a rear wall projecting upwardly respectively from opposed side edges and the rear edge of said bottom to a substantially uniform height, and a front wall projecting upwardly from the front edge of said bottom to a height less than said uniform height;

the improvement wherein each of said sidewalls comprises a

main web lying in a general plane inclined upwardly and outwardly from said bottom, said web having a plurality of like openings therethrough extending downwardly from the upper edge of said web at spaced locations along said web, each of said openings having a front edge and a rear edge, means on said web defining first, second and third horizontal shelves extending forwardly from the rear edge of the opening in vertically spaced, substantially vertical alignment with each other, said third shelf constituting the bottom edge of the opening, a plurality of like stacking feet projecting outwardly from the outer side of



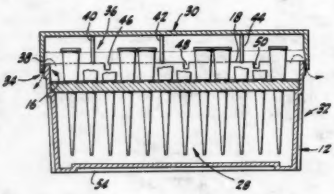
said web adjacent said bottom in respective vertical alignment with the shelves of said openings, the front edge of each opening being spaced forwardly from the front ends of the shelves by a distance greater than the front-to-rear dimensions of the aligned stacking foot, each of said shelves being adapted to receive and support a stacking foot of a like container, and continuous reinforcing rib means integral with said first and second shelves and projecting outwardly from the outer side of said main web, said rib means extending the entire length of said sidewall and passing across said openings outwardly of said main web.

4,577,760

APPARATUS FOR SUPPORTING PIPETTE TIPS

Kenneth Rainin, Piedmont, and Stephen Ruskewicz, Kensington, both of Calif., assignors to Rainin Instrument Company, Inc., Emeryville, Calif.

Filed Sep. 14, 1984, Ser. No. 650,505
Int. Cl.[4] B65D *85/30*
U.S. Cl. 206—508 **14 Claims**



1. An apparatus for supporting pipette tips prising:

a. a container having a bottom and a side portion connected to and extending from said bottom terminating in a top portion;

b. a sole tray including means for holding at least one pipette tip thereto, said container further including means for supporting said tray such that at least a portion of the at least one pipette tip lies within said container;

c. a cover, said cover being supported by said container adjacent said tray, said cover and container forming an enclosure for the at least one pipette tip, said tray forming a first chamber between one side thereof and said container bottom, and a second chamber between another side of said tray and said cover, said bottom of said container being capable of contacting said cover; and

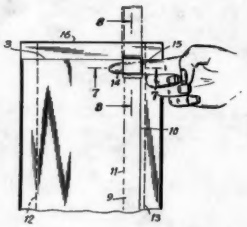
d. means for venting said enclosure, said venting means including means for separating and fixing said cover from said top portion of said side portion of said container, forming a gap therebetween, said venting means further including means for joining said first chamber to said second chamber to permit circulation of of fluid between said first and second chambers other than through any pipette top or means for holding any pipette tip to said sole tray and to permit circulation between the inside and outside of said enclosure.

4,577,761

EASY-OPEN PINCH CLOSURE BAG

Richard J. Nadaskay, Camden, Ark., assignor to International Paper Company, New York, N.Y.

Filed Mar. 26, 1985, Ser. No. 716,046
Int. Cl.[4] B65D *33/00*
U.S. Cl. 206—604 **8 Claims**



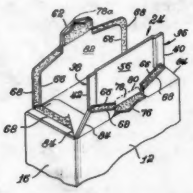
1. An easy-open pinch closure bag comprising a multi-ply bag having a front wall, a back wall, and a pinch closure at one end, said pinch closure being formed by folding an extension of at least one of the plies of the back wall over the outside of the outermost ply of the front wall and adhesively securing said extension to the outermost ply of the front wall, said outermost ply of said front wall having a longitudinal seam formed by overlapped longitudinal edges of said outermost ply and means for breaking the outermost ply across said longitudinal seam.

4,577,762

RECLOSABLE PACKAGE AND CARTON BLANK AND PROCESS FOR MAKING THE SAME

Morris W. Kuchenbecker, Neenah, Wis., assignor to James River Corporation of Virginia, Richmond, Va.

Filed Jun. 27, 1985, Ser. No. 749,886
Int. Cl.[4] B65D *5/54*
U.S. Cl. 206—612 **30 Claims**



1. In a carton blank made of carton stock having front and rear main panels, side panels articulated by fold lines to a set of end closure flaps, which comprises dust flaps, a cover flap, and a sealing flap, and coated, at least on the end closure flaps, with a heat sealing coating:

the improvement in which:

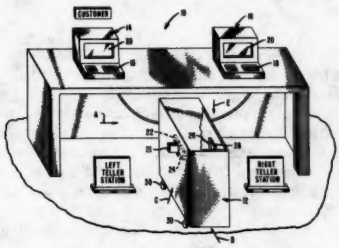
said dust flaps and said cover flap have sealing areas adjacent to the fold lines thereof;
said cover flap has cut-away end portions corresponding to the sealing areas of said dust flaps so that, when they are folded in on top of the dust flaps, the dust-flap sealing areas are exposed;
said cover flap, save for said cover flap sealing area, is coated with a non-heat-sealing coating to provide a non-sealing area which, in the end of a closed carton erected therefrom, stretches from one cut-away portion to the other and to the edge of the cover flap;
said sealing flap is adapted to be folded down onto the in-folded dust flaps and adhered to the sealing areas thereof and to the sealing area of said cover flap;
said sealing flap has a centrally-located pull tab;
an area of the sealing flap which, in the closed end, overlies the non-sealing area of the cover flap is circumscribed by a sealing-flap ply-separation means forming a ply-separable area which extends from the sealing flap fold line along the sealing area of each dust flap and along the cover flap sealing area to said pull tab;
and said sealing flap has a line of weakness which angles in from each corner to said ply separation means.

4,577,763

CASH DISPENSING SYSTEM

Dale L. Placke, Dayton; Mark D. Filliman, Beavercreek; Robert H. Granzow, Miamisburg; Jack R. Gross, Waynesville, and Charles S. Nagy, Dayton, all of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Mar. 28, 1984, Ser. No. 594,453
Int. Cl.[4] B07C *5/00*; B65H *7/00*
U.S. Cl. 209—534 **11 Claims**



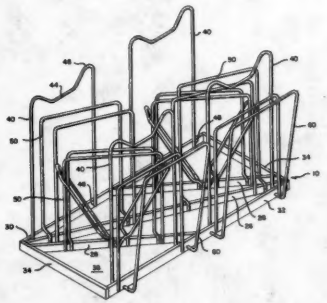
6. A system for dispensing sheets comprising:
means for entering a value of sheets to be dispensed in which said value of sheets may be comprised of a single sheet representing said value or a plurality of sheets having individual values whose collective sum represents said value; and
a sheet dispenser for dispensing sheets representing said value of sheets entered on said entering means;
said sheet dispenser comprising:
means for storing a plurality of sheets having different individual values and for selecting those sheets whose collective individual values equal said value of sheets to be dispensed;
first and second delivery areas where sheets representing said value to be dispensed are retained to be grasped by an operator using said system;
means for controlling the movement of said sheets from said storing and selecting means to said first and second delivery areas;
a collecting means located at a home position in said sheet dispenser for collecting the sheets representing said value to be dispensed;
means for transporting said sheets from said storing and selecting means to said collecting means;
a collecting bin located within said sheet dispenser;
diverting means operatively coupled to said transporting means and said collecting means for diverting to said collecting bin those sheets which are suspected by said controlling means of producing an incorrect value of sheets to be dispensed;
means for securing said sheets on said collecting means when sheets representing said value of sheets to be dispensed have been collected on said collecting means as determined by said controlling means; said securing means including a member which resiliently retains said sheets on said collecting means;
means for moving said collecting means with said sheets thereon from said home position to said first or second delivery areas in response to data also entered on said entering means so as to enable said sheets to extend from said sheet dispenser to enable a said operator to grasp said sheets moved to said first or second delivery areas;
each of said first and second delivery areas having means for holding said sheets moved thereto by said moving means against the bias of said member of said securing means while said moving means moves said collecting means to said home position;
said first delivery area comprising:
a closure for normally closing off access to said first delivery area by said operator;
means for moving said closure between opened and closed positions relative to said first delivery area; and
means responsive to said sheets on said collecting means approaching said first delivery area to activate the associated closure moving means to move said closure to said open position permitting said sheets to extend from said dispenser to be grasped;
said retaining means including a timer to energize said moving means for said closure after a predetermined amount of time to move said closure towards said closed position to retain said sheets at said first delivery area while said moving means moves said collector towards said home position.

4,577,764

WIRE RACK FOR PROCESSING HARD CONTAINER SYSTEMS IN WASHING-STERILIZERS

John L. Silka, Union City, and Gerald L. Yeaney, Erie, both of Pa., assignors to American Sterilizer Company, Erie, Pa.

Filed Jul. 9, 1984, Ser. No. 629,168
Int. Cl.[4] A47G *19/08*
U.S. Cl. 211—41 **9 Claims**



1. In a rack for holding at least one of either a first sized or a second sized rigid container within a basket of a predetermined size for insertion into apparatus for washing, sterilizing or both, where fluid is directed toward the containers through the basket from at least the bottom of the apparatus and each container includes a deep bottom portion defining a chamber,

a shallow lid for enclosing the chamber, and an intermediate portion for insertion into the chamber, and where the basket also holds a tray of instruments of a predetermined size for subsequent insertion into the bottom portion of the container, the improvement comprising:

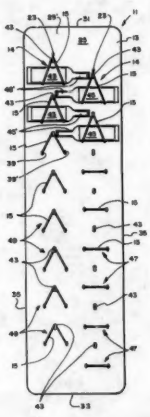
a rigid frame lying in a horizontal plane relative to the bottom of the apparatus and defining an opening, said frame having at least one substantially diagonal member crossing said opening;

a first set of wire components supported by said frame, said first set of components being positioned to support at least one of either the first or second container bottom portions in such an inverted position in a spaced relationship relative to said frame over at least a portion of said opening that the chamber can be exposed to the fluid directed from the bottom of the apparatus and can be positioned to prevent the retention of fluid within the bottom portions;

a second set of wire components disposed along said at least one diagonal member of said frame, said second set of wire components being positioned to support at least one of either of the first or second container intermediate portions in such a substantially vertical position relative to said plane in a spaced relationship beneath the bottom portion when a bottom portion is supported by said first set of components, that the retention of fluid in the intermediate portions is substantially prevented; and

a third set of wire components supported by said frame, said third set of components being positioned to support at least one of either of the first or second component lids in such a substantially obtusely angular position relative to said frame that the retention of fluid in the lids can be substantially prevented, and positioned in such a spaced relationship relative to the bottom portions and the intermediate portions when the portions are supported in said first and second sets of components, respectively, that the direction of fluid from the bottom of the apparatus toward the chambers and the intermediate portions is unobstructed by the lids.

4,577,765
WINE RACK
Terry R. Crosby, 7237 Cotton Plant Cv., Memphis, Tenn. 38119
Filed May 23, 1985, Ser. No. 737,181
Int. Cl.[4] A47B *73/00*
U.S. Cl. 211—75 **8 Claims**



1. A rack for displaying at least one bottle or the like comprising:

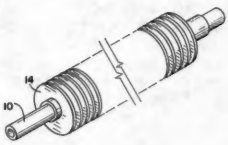
(a) a body member including a front wall having at least a pair of apertures therethrough, said front wall having a front side and a back side;

(b) an elongated flexible member movably extending through a pair of said apertures to provide a bight portion disposed adjacent said front side of said front wall and to provide a portion of said flexible member disposed adjacent said back side of said front wall;

(c) securement means attached to said body member for securing a portion of said bight portion of said flexible member to said body member and for causing said bight portion to form a pair of cradle portions for stably and removably cradling a bottle; and

(d) means attached to said portion of said flexible member adjacent said back side of said front wall for limiting movement of said flexible member through said apertures in a direction from said back side to said front side of said front wall.

4,577,766
COAT HANGER SUPPORT
Charles R. Miller, 6123 S. Quebec, Tulsa, Okla. 74136
Filed Mar. 28, 1983, Ser. No. 481,381
Int. Cl.[4] A47F *5/00*
U.S. Cl. 211—123 **20 Claims**

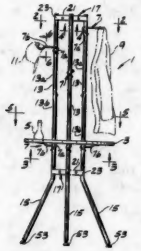


1. A coat hanger support comprising a hollow plastic tube of sufficient length and sufficient internal diameter to slip over a closet rod of the type normally employed for holding hangers thereon in a closet; a plurality of circular plastic disks mounted in spaced parallel relation on the tube and at right angles to the longitudinal central axis of the tube, the spacing between adjacent disks being between $\frac{3}{8}$ of an inch and $\frac{3}{4}$ of an inch, said disks having an outer diameter such that the disks would extend beyond the location of the tip of a coat hanger which was supported on said tube, the plastic tube being provided with a centering recess between each pair of adjacent disks for centering a coat hanger between the disks.

4,577,767
KNOCKDOWN RACK
Robert C. Geschwender, Lincoln, Nebr., assignor to New Products I, Inc., Lincoln, Nebr.
Filed May 11, 1983, Ser. No. 493,607
Int. Cl.[4] A47F *5/01*
U.S. Cl. 211—190 **23 Claims**

1. A knockdown rack comprising three vertical posts having diverging legs at their lower ends for stably supporting the rack, and a pair of supports adapted to be fastened between the posts at vertically spaced locations for rigidly interconnecting the posts in a formation wherein the posts, as viewed from above the rack, lie generally on a first circle with the posts spaced at about 120 degree intervals on the circle and the lower ends of said legs lie generally on a second circle larger in diameter than said first circle, each support comprising a relatively flat horizontal member having three peripheral recesses therein for receiving said posts, each recess having a mouth for insertion of a respective post inwardly through the mouth into the recess, and a wall structure formed and configured for contact by the post at three separate locations on the circumference of the post, said wall structure having a height not

substantially less than the diameter of a respective post for engagement with a substantial length of the post at said locations, and means for releasably fastening each post in a respective recess in each support member.



4,577,768

ETHYLENE POLYMER BLEND AND CONTAINERS PREPARED THEREFROM

Santos W. Go, deceased, late of Toledo, Ohio (by John W. Yager, administrator), and Saleh A. Jabarin, Holland, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Nov. 3, 1983, Ser. No. 548,469
Int. Cl.[4] C08L *23/18, 23/04*
U.S. Cl. 215—1 C **18 Claims**

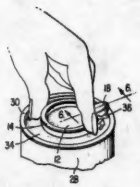
1. A plastic container having improved resistance to environmental stress cracking comprising a container formed from an intimate fusion blend of ethylene polymers; said blend containing about 75–90 weight percent of at least one linear high-density ethylene polymer and about 10–25 weight percent of at least one linear low-density ethylene polymer, said ethylene polymers constituting at least about 98 weight percent of the total polymers contained in said blend; each of the high-density ethylene polymer(s) included in the blend having a density of at least about 0.94 gm/ml, a melt index of less than about 0.5 gm/10 min, and having polymerized therein at least about 98 mol percent ethylene with any comonomer polymerized therein being an alpha-monoolefin containing about 3 to 12 carbon atoms; each of the linear low-density ethylene polymer(s) included in the blend having a density of less than about 0.93 gm/ml, a melt index of less than about 2.0 gms/10 min, and having polymerized therein about 2–6 mol percent of an alpha-monoolefin containing about 3 to 12 carbon atoms with the balance of the monomer polymerized therein being ethylene and the linear low-density ethylene polymer(s) included in the blend having a melt index higher than the melt index of the linear high-density ethylene polymer(s) included in the blend.

4,577,769

CHILD RESISTANT CONTAINER

Anthony Delia, West Redding, Conn., assignor to The Drackett Company, Cincinnati, Ohio

Filed Mar. 26, 1985, Ser. No. 716,277
Int. Cl.[4] B65D *55/02*
U.S. Cl. 215—211 **11 Claims**



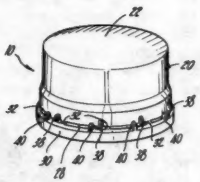
1. A child resistant closure construction for a container, the container having a wall portion, the wall portion having a circular dispensing opening therethrough, the dispensing opening having a removable and reinsertable closure plug normally positioned therein to close the dispensing opening, the closure plug including locking means to normally maintain it in the dispensing opening against casual upward withdrawal, the closure plug carrying a radially extending ear, the closure plug and ear being capable of executing at least limited angular movement about an axis passing through the center of the circular dispensing opening, an abutment carried by the closure member and being located radially outwardly of the periphery of the circular dispensing opening and being in the annular path of at least a portion of the ear upon angular movement of the ear and closure plug, the abutment and the ear being configured to cause the ear to to tilt away from the container interior, whereby the closure plug and/or the ear can be manually grasped and removed to thereby gain access to the contents of the container.

4,577,770

TAMPER INDICATING SCREW CAP

David M. Wright, Evansville, Ind., assignor to Sunbeam Plastics Corporation, Evansville, Ind.

Filed Mar. 18, 1985, Ser. No. 713,276
Int. Cl.[4] B65D *41/34*
U.S. Cl. 215—252 **12 Claims**



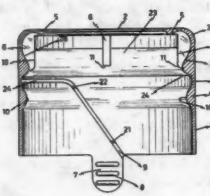
1. A one-piece tamper indicating closure for a container having external threads and an annular flange below said threads, said closure comprising: a cylindrical skirt having internal threads complementary to the external threads on said container, a tamper indicating ring spaced radially outward from and extending below said cylindrical skirt defining an open area therebetween, a retaining bead on the inner surface of said ring engageable with the underside of the annular flange on said container to prevent removal of said ring, drive lug means extending radially outward from said skirt into said open area and driven lug means extending radially inward from said ring into said open space in proximate circumferentially spaced relationship to each other, a plurality of shear webs circumferentially spaced from said lug means extending into said open area and joining said skirt and said ring, first land means associated with said skirt and second land means associated with said ring disposed in proximate circumferentially spaced relationship to each other, said lug means and land means being movable circumferentially into engagement with each other, said engagement between lug means being in a radially extending vertical plane, upon application of a capping torque on said skirt and simultaneous engagement of said retaining bead with the top of said annular flange to maintain said ring axially and circumferentially stationary relative to said skirt while said bead is snapped over said annular flange, said webs being sheared upon opening movement of said skirt relative to said ring as said ring is maintained stationary relative to said container to separate said ring and skirt, said ring being retained on said container as said closure is removed.

4,577,771

TEARABLE BOTTLE CAPS

Francisco P. Martinez, Callejon de Pino Suarez 1636, Col. Libertad, Tijuana, B. C., Mexico, D. F., Mexico

Filed Jan. 22, 1985, Ser. No. 693,129
Int. Cl.[4] B65D *41/48*
U.S. Cl. 215—256 7 Claims



1. A tearable bottle cap for large capacity bottles comprising a top planar disk, an approximately cylindrical skirt depending from said planar disk to snugly fit around the neck of the bottle, a slant score line starting at the lower edge of said skirt, a pull tab projecting downwardly of said lower edge of the skirt, one of the side edges of the pull tab being arranged to terminate at the point of said lower edge of the skirt where the score line starts, a first inner solid bead having an arcuate surface and extending throughout the circumference of said skirt at a predetermined distance from said top disk, in order to engage the lower portion of the upper bead of a bottle neck, a second solid inner bead extending throughout the circumference of said skirt and at a predetermined distance above said first solid inner bead for forming a channeled depression therebetween in order to trap in said depression the upper bead of the associated bottle neck, a plurality of vertical, radially inwardly directed lugs projecting from the inner surface of said skirt from said top disk to said second solid inner bead and having their lower edges as well as part of their lengths embedded within said second solid inner bead to be reinforced thereby, said lugs being equidistantly distributed around the periphery of said disk and having a width such that they will accomodate therebetween the upper terminal portion of a threaded bottle neck, said radially inwardly directed lugs together with said second solid inner bead serving as a rigidifying assembly for the upper portion of the cap in order to provide a shock absorber when the cap is used with unthreaded neck bottles, and a circumferential internal rib projecting from the inner surface of said top disk, said internal rib being of a diameter such that the upper edge of the terminal portion of a threaded neck bottle will abut thereon, in order to serve as a shock absorber for the upper edge of the bottle neck when the cap is used with threaded neck bottles, said radially inwardly directed lugs serving as rigidifying elements of the upper portion of the cap by abutment of the outer edges on the threads of the terminal portion of the threaded neck bottle, in order to avoid sidewardly directed movements of the cap.

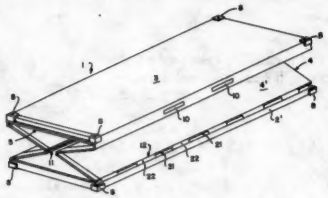
4,577,772

COLLAPSIBLE CONTAINERS

Juan B. Bigliardi, Sante Fe 3735 4th Floor "A", 1425 Buenos Aires, Argentina

Filed Mar. 26, 1985, Ser. No. 697,515
Int. Cl.[4] B65D *7/26*
U.S. Cl. 220—1.5 7 Claims

1. Improvements on collapsible containers comprising a box-like prismatic structure formed by a floor section, a top section, a pair of sidewalls connected by hinge means to said floor section and said top section, respectively, along a central hinge line to define portions of equal surface area in said sidewalls adapted to be folded upon themselves and toward the interior of the container, with the ends of the structure closed by respective door members or end portions pivotably mounted and adapted to be folded backward toward the interior of the container, with said top section and said floor section comprising a profiled frame with generally prismatic corner brackets which form engaging means used in hoisting the container, and with the container walls provided with cooperating locking members to keep the walls rigidly connected in the assembled position of the container, characterized in that said door members or end portions are mounted so that they can pivot or swivel toward the top section of the structure on coaxially disposed pivot pins extending from opposite sides of said top section, that the hinge members of the sidewalls engaging the floor section and the top section, respectively, are formed by a pair of sets of U-shaped oppositely oriented plates, that the legs of the plates of one of the sets are integral with the hinge means rigidly connected to the legs of a U-shaped profile forming part of the sidewalls, whereas the



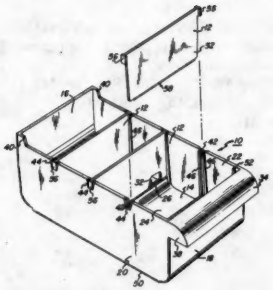
legs of the plates of the other set are connected to the legs of a U-shaped profile forming an integral part of said top section, that a set of U-shaped plates of said hinge means is rigidly joined with a hinge line extending across the U-shaped plates of the other set and adapted to move freely with respect to said hinge line, that the intermediate portions of said U-shaped plate form an enclosure of the hinge means in said U-shaped profiles integral with the respective sidewall and the top section in the assembled state of the container, that the plates of the two sets remain connected and pivotable around said axis in a second, collapsed state of the container, and that the frames forming the top section and the floor section are provided with supports for connecting corresponding protruding locking means extending from the frames of said sidewalls and from the door members or end portions of the container.

4,577,773

UTILITY BOX

Vincent J. Bitel, Rockfall, Conn., assignor to The Rogers Manufacturing Co., Rockfall, Conn.

Filed Aug. 10, 1984, Ser. No. 639,451
Int. Cl.[4] B65D *25/06*
U.S. Cl. 220—22.3 8 Claims



1. A utility box having a generally rectangular configuration comprising:

A. a container having a generally rectangular bottom wall,

and a pair of end walls and a pair of side walls extending upwardly from said bottom wall and defining a generally rectangular cavity, said side walls having aligned slots extending through the upper edges thereof, said side wall having opposed pairs of vertically extending ribs on the inner surface thereof aligned with said slots to form channels said bottom wall having upstanding ribs extending transversely between said side walls; and

B. a plurality of compartment dividers extending between said side walls of said container member and having engagement arm portions adjacent the upper end thereof extending through said slots and having flange portions exending along the outer surface of said side walls about said slots to maintain said dividers and side walls in assembly, said dividers having their side edge portions seated in said channels of said side walls and their bottom edges seated on ribs of said bottom wall, said dividers being of a height not greater than that of said container.

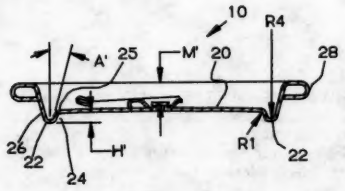
4,577,774
BUCKLE RESISTANCE FOR METAL CONTAINER CLOSURES

Tuan A. Nguyen, Broomfield, Colo., assignor to Ball Corporation, Muncie, Ind.

Continuation of Ser. No. 565,995, Dec. 27, 1983, abandoned, which is a division of Ser. No. 357,032, Mar. 11, 1982, Pat. No. 4,434,641. This application Mar. 12, 1985, Ser. No. 711,001

Int. Cl.⁴ B65D *8/08, 17/00*

U.S. Cl. 220—66 **2 Claims**



1. A metal closure comprising a circular domed central panel portion, a generally U-shaped sidewall having inner and outer upstanding legs, and an intermediate curved section integrally connecting said panel portion to said inner leg adjacent to the upper extremity thereof, said intermediate curved section having a thinned annular band of cold flowed metal formed therein immediately adjacent the upper surface thereof wherein said annular band of cold flowed metal is a frustoconical surface which angles upward and away from the horizontal in the radially inward direction and the lower surface of said intermediate curved section immediately opposite said thinned annular band of cold flowed metal is of an arcuate concave configuration, said thinned annular band being compressed cold worked and defined by a flat surface having a width of between about 0.020 and about 0.040 inches, the flow of said metal of said thinned annular band being sufficient resulting in said panel portion of said metal closure being domed axially outwardly and said inner leg being deflected towards a substantially vertical configuration.

2. A metal closure comprising a circular domed central panel portion, a generally U-shaped sidewall having inner and outer upstanding legs, and an intermediate curved section integrally connecting said panel portion to said inner leg adjacent to the upper extremity thereof, said intermediate curved section having a thinned annular band of cold flowed metal formed therein immediately adjacent the upper surface thereof wherein said annular band of cold flowed metal is straight and substantially parallel to the horizontal and the lower surface of said intermediate curved section immediately opposite said thinned annular band of cold flowed metal is of an arcuate concave configuration, said thinned annular band being compressed cold worked and defined by a flat surface having a width of between about 0.020 and about 0.040 inches, the flow of said metal of said thinned annular band being sufficient resulting in said panel portion of said metal closure being domed axially outwardly and said inner leg being deflected towards a substantially vertical configuration.

4,577,775
CUP-SHAPED CONTAINER

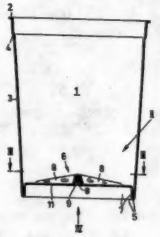
Hermann Kresin, Bergneustadt, Fed. Rep. of Germany, assignor to Gizeh-Werk GmbH, Bergneustadt, Fed. Rep. of Germany

Filed Dec. 10, 1984, Ser. No. 679,949

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1983, 3344779

Int. Cl.⁴ B65D *41/20*

U.S. Cl. 220—66 **7 Claims**



1. A plastic cup-shaped container having a longitudinal axis, a generally frustoconical peripheral wall, a base wall, and means providing for flexure of the base wall in the direction of the longitudinal axis between volume-increasing and volume-decreasing positions, the flexure providing means comprising radially extending folds in the base wall projecting from a common central depression toward the periphery of the base wall and triangular base wall panels connecting adjacent folds for providing opening and closing of the folds when the base wall is flexed between said positions.

4,577,776
CONTAINERS AND LEVER RING

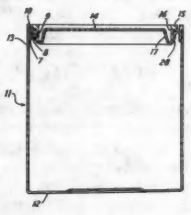
Adrien P. Rayner, Iver, and Kenneth R. Clark, Standlake, both of England, assignors to Metal Box Plc, Berkshire, England

Filed Nov. 27, 1984, Ser. No. 675,315

Claims priority, application United Kingdom, Dec. 2, 1983, 8332287

Int. Cl.⁴ B65D *41/16*

U.S. Cl. 220—307 **14 Claims**



1. A lever ring for a container body and adapted to receive a plug lid removable from the ring by means of a lever, wherein the ring is moulded from a plastics material and comprises an annular flange adapted to fit in an open upper end of the container body and to engage with the interior surface of the container body, a flared portion and a ring portion adapted to receive and grip, when in use, a plug portion of a plug lid,

said flared portion extending from the upper end of the annular flange radially and axially into the ring portion in the downward direction inwardly of the container body, whereby said flared portion permits easy entry of the plug portion of the plug lid and thereafter firm retention of the lid.

4,577,777

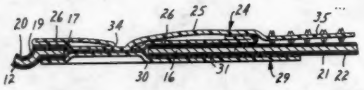
TAPE CLOSURE FOR A CAN END

Wilfred R. Brochman, Oakdale, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 561,462, Dec. 14, 1983, Pat. No. 4,500,011, which is a continuation-in-part of Ser. No. 458,564, Jan. 7, 1983. This application May 10, 1985, Ser. No. 732,842

Int. Cl.[4] B65D *41/00*

U.S. Cl. 220—359 **6 Claims**



1. A container end assembly comprising:

a container end formed of tin plated steel having an exterior surface and an interior surface and being formed with a pour opening;

a polymeric layer comprising epoxy/urea formaldehyde bonded to said exterior surface of said end; and

a tape strip comprising a backing and a thermoplastic adhesive coating on one surface of said backing, said tape strip being bonded by said adhesive to an area of the exterior surface of said layer circumjacent and covering said pour opening, said adhesive forming a bond between said tape strip and said polymeric layer, the bond between said adhesive and said backing and said layer having greater strength than the bond between said layer and the exterior surface of said tin plated steel end supporting said layer, causing said layer to break and peel from said end upon removal of the tape strip from the container end.

4,577,778

REFUSE RECEPTACLE

Myong H. Kim, Seoul, Rep. of Korea, assignor to Woo Kyong Industrial Co., Ltd., Seoul, Rep. of Korea

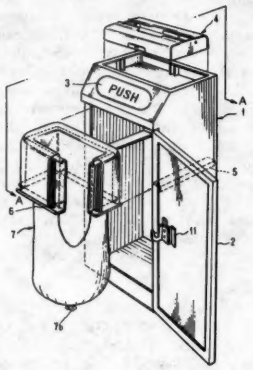
Filed May 3, 1985, Ser. No. 730,057

Claims priority, application Rep. of Korea, Dec. 31, 1984, 14575/84

Int. Cl.[4] B65D *67/04*

U.S. Cl. 220—404 **5 Claims**

1. A refuse receptacle comprising, an outer upstanding enclosure and a refuse collecting bag mounted therein, said outer enclosure having a refuse inlet opening in a front upper portion thereof and an opening for removing the bag when filled with refuse, a tubular bag holder mounted on the inside of the upper portion of said outer enclosure, said holder having outwardly extending flanges at a lower end thereof, said bag comprising a continuous elongated vinyl sleeve having a fanfolded upper end of several upstanding folded layers, said upper end of said sleeve being mounted on the outer peripheral surface of said holder which has substantially the same length and outer dimension as the folded length and inner diameter of said fanfolded upper end of said sleeve, and said fanfolded upper end of said sleeve being solely supported by said flanges, said sleeve extending from said fanfolded upper end thereof over an upper end of said holder and through the inside of said holder



so as to terminate at its free end beyond said lower end thereof, said free end of said sleeve being tied for closing same.

4,577,779

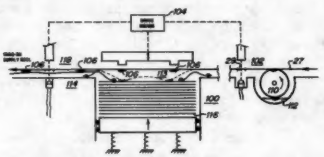
CURRENCY-DISPENSING METHOD AND APPARATUS

Martin M. Atalla, Atherton, Calif., assignor to Atalla Corporation, San Jose, Calif.

Continuation-in-part of Ser. No. 446,074, Dec. 1, 1982, Pat. No. 4,515,288. This application Jan. 3, 1984, Ser. No. 567,688

Int. Cl.[4] B65H *5/28*

U.S. Cl. 221—1 **7 Claims**



1. Apparatus for selectively dispensing units of currency, comprising:

housing means for confining a quantity of units of currency to be dispensed in a configuration from which single units of currency are extractable in succession;

means supporting said housing means for movement of the units of currency confined thereby between first and second positions;

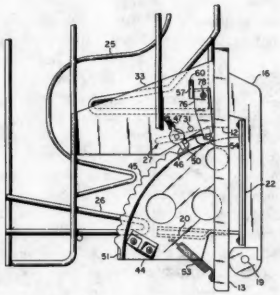
transport means having isolated adhesive regions disposed along the length thereof and being supported for movement selectively along a path that passes adjacent the quantity of units of currency between said first and second positions; and

means operable with said housing means to engage selected ones of said adhesive regions and a single unit of currency of said quantity thereof, and to move said single unit and said transport means substantially along said path at the same velocities between said first and second positions to adhesively attach said single unit and said transport means.

4,577,780
ARTICLE-DISPENSING ASSEMBLY FOR A VENDING MACHINE

Charlie R. Holland, St. Louis, and Michael J. DelPercio, Fenton, both of Mo., assignors to Coin Acceptors, Inc., St. Louis, Mo.

Filed Dec. 20, 1982, Ser. No. 451,035
Int. Cl.[4] G07F *11/00*
U.S. Cl. 221—125 27 Claims



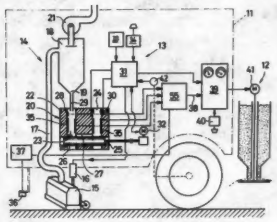
1. An article-dispensing assembly, comprising:
(a) a plate provided with an opening,
(b) a door movably mounted on the plate, the door being movable selectively to a first closed position and to a second open position relative to the opening, and the door including a shelf extending inwardly of the opening and providing a bin for holding an article to be dispensed,
(c) feed means for feeding articles to the bin,
(d) a control means movable to a first position to allow transfer of an article from the feed means to the bin, and movable to a second position to block transfer of an article from the feed means to the bin,
(e) operating means selectively interconnecting the control means and door to allow loading of the bin when the door is in its first closed position and to preclude loading of the bin when the door is moved from its first closed position,
(f) a slide bar slidably mounted and extending transversely of the bin,
(g) an interlock means movably mounted at one side of the opening and movable to a first position blocking sliding movement of the slide bar, and to a second position allowing sliding movement of the slide bar to an extended position,
(h) coin-actuating means connected to the interlock means and selectively moving the interlock means from its first position to its second position, and
(i) a slide bar actuating means carried by the control means and operatively interconnecting the door and the slide bar and operatively engaging the slide bar to move the slide bar to the extended position to allow movement of the door from its first closed position to its second open position when the interlock means is in its second position.

4,577,781
APPARATUS FOR CONTROLLING THE REGULATOR OF A DEVICE FOR SPREADING SALT OR THE LIKE ON ROADS

Otto P. Braun, Ludwigsburger Strasse 80, D-7141, Freiberg/-Neckar, Fed. Rep. of Germany

Filed Nov. 8, 1983, Ser. No. 549,775
Claims priority, application Fed. Rep. of Germany, Nov. 9, 1982, 3241285
Int. Cl.[4] E01G *1/00*
U.S. Cl. 222—54 10 Claims

1. An apparatus for controlling the regulator of a device for spreading salt and the like onto road surfaces, the apparatus comprising:
means for measuring the temperature of liquid on the road surface;
means for collecting liquid from the road surface, adapted for operation on a moving vehicle;
means operatively associated with the collecting means for measuring the concentration of salt in the collected liquid; and,

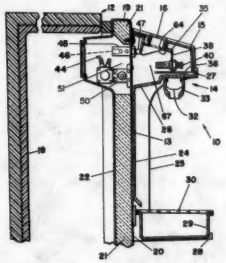


means operatively associated with the collecting means for measuring the quantity of liquid present per surface unit area of the road, based upon the quantity of collected liquid, a width of said collecting means, and a measured factor related to movement of the vehicle along the road, whereby sufficient information is available from the apparatus for regulation of a device for spreading salt and the like to achieve a salt concentration on the road surface just sufficient to avoid freezing at any predetermined temperature and for any predicted quantity of precipitation.

4,577,782
BEVERAGE DISPENSING STATION

Herman S. Fessler, Coon Rapids, Minn., assignor to The Cornelius Company, Anoka, Minn.

Filed May 2, 1983, Ser. No. 492,870
Int. Cl.[4] B67D *5/56*
U.S. Cl. 222—129.1 16 Claims



1. A beverage dispensing machine having an improved beverage dispensing station mounted upon a panel of the machine, comprising
(a) a chassis mounted upon the panel;
(b) a beverage dispensing head supported from the chassis;
(c) beverage lines leading from the panel to the head, said lines being above an underpanel of the chassis;
(d) a cover removably mounted upon the chassis, said cover having apertures for selector buttons and means for enclosing the beverage lines;
(e) beverage selector buttons mounted to the panel by a horizontal axis hinge underneath and inside of the cover, said buttons being registered with and being accessible through respective apertures and being operable when the cover is either mounted upon or removed from the chas-

sis, said buttons being movable to an alternative position for withdrawal of valve elements normally operable by the buttons, and

(f) means under the cover and mounted to the machine independently of the cover for normally restraining the selector buttons against the valve elements when the cover is removed.

4,577,783

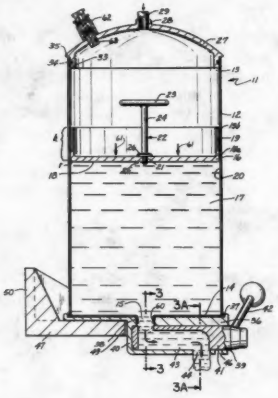
DISPENSER

Richard F. Racca, Melrose; Willem Swier, and Anthony E. Di Maio, both of Georgetown, all of Mass., assignors to Marson Corporation, Chelsea, Mass.

Continuation of Ser. No. 624,642, Oct. 22, 1975, abandoned, which is a continuation of Ser. No. 341,759, Mar. 15, 1973, abandoned, which is a continuation-in-part of Ser. No. 292,722, Sep. 27, 1972, abandoned, which is a continuation of Ser. No. 833,259, Jun. 16, 1969, abandoned. This application Dec. 13, 1979, Ser. No. 103,526

Int. Cl.[4] B67D *5/54*

U.S. Cl. 222—386.5 **1 Claim**



1. A device for dispensing high viscosity fluid material which includes a container having an inner wall of predetermined diameter, a selectively operable valve means providing in open condition a flow passage for fluid material out of the container and propelling means movable along a wall in any one of a plurality of containers in repeated use for forcing the fluid material through the flow passage and out of the container with which it is then in use, the improvement wherein said propelling means includes:

(a) a follower plate at commencement of each use situated in contact with the fluid material within the container and mounted for movement toward the valve means, said follower plate having a bottom wall which normally is relatively flat yet deformable nonpermanently to a substantially dish-like shape under conditions of a negative clearance between said inner wall of said container and an upstanding side wall located about the periphery of the bottom wall, said upstanding side wall consisting of a wiping portion and a guide portion extending from the wiping portion throughout the remainder of the side wall, said guide portion being located to trail the wiping portion as determined with reference to the direction of movement of the follower plate within the container, and said side wall maintaining substantially its peripheral contour under circumstances resulting in deformation of said bottom wall, said follower plate being further characterized by:

1. the outer diameter of the wiping portion being greater than that of the guide portion and having one of a positive and negative clearance with respect to the inner diameter of the container of up to about 0.018 inch;
2. the side wall having an effective height equal to at least 10% of said outer diameter, said follower plate being formed of a sufficiently flexible and resilient material to undergo flexure without permanent deformation into a configuration such that the outer diameter of said wiping portion may be reduced in dimension by an amount approximately equal to any negative clearance which may exist between the follower plate and the inner wall of the container with which it is then in use, said wiping portion providing a seal to flow of fluid material from one side of said follower plate to the other,
3. the guide portion having an outer diameter substantially uniform in dimension, and
4. an orifice in said bottom wall to provide a flow path for fluid from one side of said follower plate to the other in movement of said follower plate into contact with said fluid material, yet adapted to be sealed in use of said device; and

(b) drive means for forcefully moving the follower plate toward the open valve means to force fluid material out of the container through said flow passage.

4,577,784

VALVE FOR DISPENSING A MEASURED VOLUME OF FLUID FROM A CONTAINER CONTAINING A FLUID SUBSTANCE UNDER PRESSURE

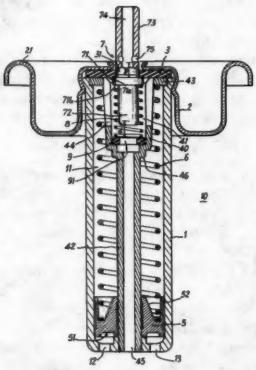
Michel Brunet, Sainte Colombe La Commanderie, France, assignor to Etablissements Valois, Le Neubourg, France

Filed Jan. 16, 1985, Ser. No. 691,816

Claims priority, application France, Feb. 10, 1984, 84 02045

Int. Cl.[4] B65D *83/14*

U.S. Cl. 222—402.2 **4 Claims**



1. A valve for dispensing a measured volume of a fluid from a container containing a fluid substance under pressure, the valve comprising a variable volume chamber constituted by a rigid body in which a piston subjected to the pressure in the container is free to move against the force of a piston return spring, the valve further comprising a plunger subjected to the action of a plunger return spring and capable of controlled movements to put the variable volume chamber into communication with the substance, or else, after interrupting said communication, to put the variable volume chamber into communication with the outside, the valve including the improvement wherein the said rigid body is a tubular body containing a plunger-receiving chamber and a central tube coaxial with the said tubular body, the plunger-receiving chamber being located at a substance-dispensing end of the tubular body and

being connected to one end of the central tube whose other end opens out at the opposite end of the tubular body, said variable volume chamber being generally annular in section and extending inside the tubular body and outside the central tube and the plunger-receiving chamber, and the piston being an annular piston mounted to move axially in said variable volume chamber, said variable volume chamber being connectable to the interior of the container via the plunger-receiving chamber and the central tube under the control of the plunger.

4,577,785

HINGED ROTARY NOZZLE

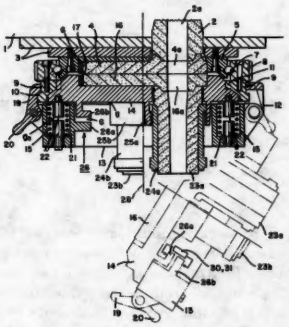
Senzo Wakabayashi, Tokyo, Japan, assignor to Nippon Kokan Kabushiki Kaisha, Tokyo; Nippon Rotary Nozzle Co., Ltd., Kawasaki; Kokan Kikai Kogyo Kabushiki Kaisha and Tokyo Yogyo Kabushiki Kaisha, both of Tokyo, all of, Japan

Continuation-in-part of Ser. No. 138,845, Apr. 10, 1980, abandoned. This application Nov. 2, 1984, Ser. No. 667,758

Claims priority, application Japan, Apr. 13, 1979, 54-44266

Int. Cl.[4] B22D *41/08*

U.S. Cl. 222—598 **3 Claims**



1. A door-type rotary nozzle for attachment to a bottom discharge opening of a molten metal container such as ladle or tundish, said nozzle comprising: a stationary bottom plate brick having a nozzle bore in register with said discharge opening; a stationary frame mounted to the bottom of said container for attaching said stationary bottom plate brick in surrounding relationship with said discharge opening; an annular door frame carried by said stationary frame; hinge means for pivotably connecting said door frame with said stationary frame; a sliding plate brick having a nozzle bore capable of communicating with said nozzle bore of said stationary bottom plate brick when the sliding plate brick is in surface contact with said stationary bottom plate brick; an inner frame supported within said door frame and adapted for holding said sliding plate brick in surface contact with said stationary bottom plate brick when said door frame is closed, said inner frame removably carrying a molten metal discharging collector nozzle to be removably attached thereto within an annular inner periphery of said door frame so that the collector nozzle is in communication with the nozzle bore in said sliding plate brick; a plurality of dogs pivotably mounted to the outer periphery of said door frame and holding the door frame closed by engaging with said stationary frame; compressible resilient means carried between said door frame and said inner frame and adapted for pressing said sliding plate brick toward said stationary plate brick which is in surface contact with said stationary bottom plate when said door frame is closed, so that the pressing is supported by said stationary frame when said dogs are kept engaged with said stationary frame; lug pairs securely mounted to said door frame and said inner frame within the annular inner periphery of said door frame and in opposition to each other; said lug pairs adapted to receive means for urging said lug pairs together to maintain said resilient means in compression when said door frame is opened; and drive means for driving said inner frame in rotation to thereby rotate said sliding plate brick relative to said stationary plate brick while said door frame remains closed.

4,577,786

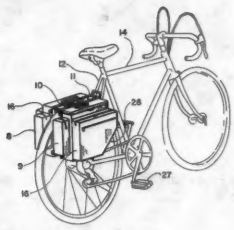
PANNIER BAG HAVING A CLAMPING DEVICE WITH LOCKING MEMBER

David C. Dowrick, Boulder; Edward K. Hine, Jr., Louisville, and Gregory S. Hine, Boulder, all of Colo., assignors to Hine-Snowbridge, Inc., Boulder, Colo.

Filed Jul. 13, 1984, Ser. No. 630,645

Int. Cl.[4] B62J *9/00*

U.S. Cl. 224—32 A **12 Claims**



1. A clamping device for securing a pannier bag assembly to a bicycle structure, said device comprising:

first structure engaging means having one portion mounted on said assembly and a second portion extending from said assembly for engaging structure positioned adjacent to said assembly;

second structure engaging means;

lever means mounted on said assembly, said lever means including a lever arm one portion of which has said second structure engaging means thereon, and a second portion for actuating said lever arm to cause movement of said second structure engaging means in a direction to exert a force upon said structure between said first and second engaging means; and

latching means including, at least in part, stiff wall means extending substantially parallel to the path of travel of said second structure engaging means during said movement of said second structure engaging means in said first direction, with said stiff wall means being positioned adjacent to said second structure engaging means throughout said movement of said second structure engaging means in said first direction, so that, after said movement in said first direction, said stiff wall means acts in conjunction with said lever means to exert a continuing force on said structure between said first and second structure engaging means until said lever arm is actuated to cause said second structure engaging means to be moved in a direction opposite to said first direction to thereby release said force applied while said lever arm was in said force exerting position.

4,577,787

INVERTIBLE AND REVERSIBLE HOLSTER

Fredrick B. Hersey, 360 Fairview Dr., Carson City, Nev. 89701

Filed May 10, 1984, Ser. No. 608,706

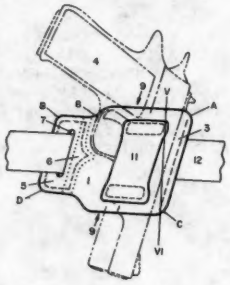
Int. Cl.[4] F41C *33/02*

U.S. Cl. 224—243 **5 Claims**

1. A belt holster made of sheet-like material having sufficient flexibility to allow insertion and withdrawal of a handgun from either end and sufficient stiffness to retain said handgun until intentionally withdrawn, comprising in combination:

a. a handgun carrier with its outer faces joined together such that the joining forms the shape of a double-ended gun

pocket, and said joining forms a trigger guard stop, against which the trigger guard seats when the gun is inserted from either end, and with said gun pocket being fitted to the gun to be carried, and capable of enclosing major



portions of the barrel, slide, receiver and trigger guard, and

b. means for positioning said gun pocket on a belt in different directions and angles at any point on said belt.

4,577,788

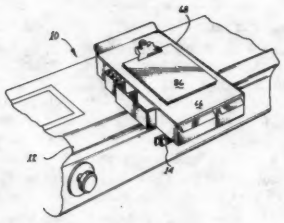
PORTABLE MULTIPURPOSE DESK CONTAINER

Jennings R. Richardson, 49 S. Cholla, Gilbert, Ariz. 85234

Filed Sep. 24, 1984, Ser. No. 653,568

Int. Cl.[4] B60R *7/00*

U.S. Cl. 224—273 **19 Claims**



1. A portable multipurpose desk container, comprising:

a body means having at least one side compartment integral thereto for holding a variety of objects, said compartment having at least one enclosure extending along the height of said side of said compartment;

an upper lid means operably and removably coupled to said body means for opening and closing said body means so that objects can be placed within and removed from said body means;

a lower lid means operably coupled to said body means for holding said upper lid means in place when said upper lid means is closed; and

a support means operably coupled to said body means for removably mounting said body means to a vehicle dashboard and for mounting said body means on a substantially flat surface after said body means is removed from said vehicle dashboard, said support means comprising (a) a hinged member coupled to the bottom portion of said body means for supporting one end of said body means while said body means is mounted to said vehicle dashboard, said hinged member has apertures passing therethrough and a quick attach-detach surface fastened thereto for operably and removably coupling said quick attach-detach surface to a corresponding quick attach-detach surface fastened to said vehicle dashboard; and (b) at least one support arm operably and removably coupled to the bottom portion of said body means for supporting the other end of said body means while said body means is mounted to said vehicle dashboard, said support arm suitable for being bendable at a plurality of portions therethroughout said support arm.

4,577,789

DEVICE FOR SEVERING SETS OF ENDLESS FORMS OR THE LIKE

Horst Hofmann, and Jürgen Reckert, both of D-Prien am Chiemsee, Fed. Rep. of Germany, assignors to Systemform Datenbelege GmbH, D-Prien am Chiemsee, Fed. Rep. of Germany

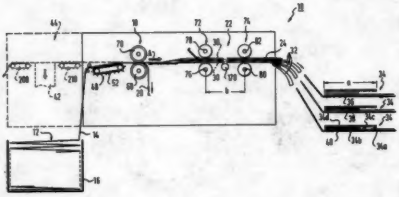
PCT No. PCT/DE83/00089, § 371 Date Jan. 12, 1984, § 102(e) Date Jan. 12, 1984, PCT Pub. No. WO83/04013, PCT Pub. Date Nov. 24, 1983

PCT Filed May 13, 1983, Ser. No. 572,671

Claims priority, application Fed. Rep. of Germany, May 14, 1982, 3218304

Int. Cl.[4] B65H *35/10*

U.S. Cl. 225—100 **32 Claims**



1. Device (10) for severing multi-layer sets (14; 14') of endless forms or the like provided with transverse perforations (28), with a tear-off arrangement (22) of two transporters arranged with spacing (b) from one another in the transport path of the set (14; 14'), the forward transporter in the transport direction (A) being drivable with higher speed than the rear transporter in order to generate, in the section of the set (14,; 14') situated between the transporters a tension stress causing the tearing of one of the transverse perforations (28), characterized in that between two successive layers (13) of the set (14) there are provided elongated separating members (30) which extend in the transport direction (A) between a rear securing point (138) behind the rear transporter and a forward securing point before the forward transporter.

4,577,790

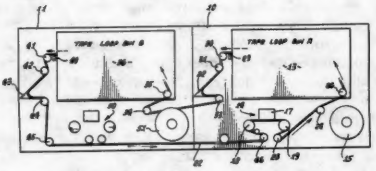
TAPE LOOP BIN CONTROL SYSTEM

Barrett P. Bingaman, Burbank; Richard G. Krum, Thousand Oaks, and James R. Williams, Sun Valley, all of Calif., assignors to Cetec Corporation, El Monte, Calif.

Filed Apr. 23, 1985, Ser. No. 726,404

Int. Cl.[4] B65H *20/24;* G11B *15/58*

U.S. Cl. 226—118 **9 Claims**



1. In a control system for operating two magnetic tape loop

bins in series with a continuous tape having an end of tape marker, the combination of:

guide means for guiding a tape from a first bin to a second bin and from said second bin past a magnetic head station to said first bin;

a first end of tape sensor positioned between said first and second bins, and providing a first signal when an end of tape marker passes said first sensor;

a second end of tape sensor positioned between said second and first bins, and providing a second signal when an end of tape marker passes said second sensor;

first and second tape drive motors for driving tape through said first and second bins, respectively;

a first motor control for one of said drive motors for driving a tape at about a constant tension;

a second motor control for the other of said drive motors for driving tape at a controlled speed which varies as a function of an error signal;

error signal computer means having said first and second signals as inputs and providing as an output, an error signal which varies as a function of the differences in time for said tape marker to move from said first sensor to said second sensor, and from said second sensor to said first sensor; and

means for connecting said error signal to said second motor control.

4,577,791

GRIPPER FEED ADVANCE MECHANISM FOR A PRESS OR THE LIKE

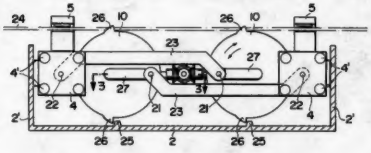
Werner Leinhaas, Alte Leipziger Str. 40a, D-6460 Gelnhausen, Fed. Rep. of Germany

Filed Apr. 27, 1984, Ser. No. 604,729

Claims priority, application European Pat. Off., May 4, 1983, 83710024.7

Int. Cl.⁴ B65H *17/26*

U.S. Cl. 226—142 **12 Claims**



1. A gripper mechanism for feeding sheet metal bands, strips or profiled stock in a feed advance direction into a processing station, comprising housing means, two movable feed advance clamps spaced from each other in said feed advance direction by an adjustable spacing, two carriages, each carriage carrying on feed advance clamp, guide means mounted in said housing means for guiding the movement of said carriages of said feed advance clamps, direction reversible drive means supported by said housing means, two crank drive assemblies mounted in said housing means for transmitting driving power from said direction reversible drive means through said crank drive assemblies to said carriages to move said carriages in unison back and forth, said crank drive assemblies comprising two adjustable crank radius determining members, one member for each assembly, and crank radius adjustment means connected in common to both crank radius determining members for adjusting both crank radii in synchronism to make said spacing between said feed advance clamps larger or smaller, and wherein said crank radius adjusting means comprise a first bevel gear, adjustment means connected to said first bevel gear for rotating said first bevel gear, two second bevel gears arranged for meshing with said first bevel gear, two screw shafts operatively connected to said second bevel gears, each of said crank radius determining members having a threaded hole through which the respective one of said two screw shafts extends for rotating said screw shafts to thereby move said crank radius determining members along the respective screw shaft.

4,577,792

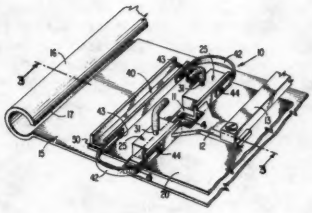
ROBOTIC WORK FABRIC MANIPULATOR

John M. Franke, Sr., Glendale, Calif., assignor to The Singer Company, Stamford, Conn. and AVG Productions, Inc., Valencia, Calif.

Filed Apr. 2, 1985, Ser. No. 719,096

Int. Cl.⁴ B65H *20/22*

U.S. Cl. 226—162 **5 Claims**



1. In a fabric manipulating device for performing a robotic fabric handling operation including a fabric engaging shoe having a fabric engaging sole plate, means for gripping a ply of fabric against said sole plate, and means for shifting said fabric engaging shoe relatively to a fabric supporting platform, means for directing the free edge of a fabric ply extending from said fabric engaging shoe into the constricted mouth of a fabric influencing folder or the like comprising:

a fabric depressing element,

means carried by said fabric engaging shoe for supporting said fabric depressing element above the free edge of a fabric ply extending from said fabric engaging shoe on said fabric supporting platform, and

biasing means extending between said fabric depressing element and said fabric engaging shoe accomodating movement of said fabric depressing element toward and away from said fabric engaging shoe.

4,577,793

POWDER CHARGE OPERATED FASTENING ELEMENT SETTING DEVICE

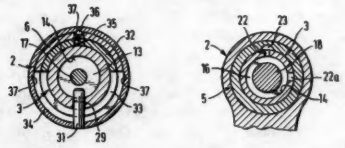
Peter Jochum, Meiningen, Austria, assignor to Hilti Aktiengesellschaft, Fürstentum, Liechtenstein

Filed May 14, 1985, Ser. No. 734,037

Claims priority, application Fed. Rep. of Germany, May 16, 1984, 3418238

Int. Cl.⁴ B25C *1/08*

U.S. Cl. 227—10 **7 Claims**



1. Powder charge operated setting device for driving fastening elements, such as bolts, nails and the like, into a hard receiving material, comprising a housing, a barrel located within said housing and having an axially extending bore therethrough, said barrel having a front end and a rear end, an

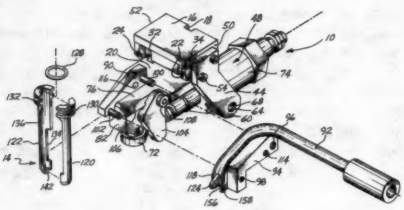
axially extending driving piston mounted within said bore in said barrel and being axially displaceable therein, said piston having a front end and a rear end, said driving piston being axially displaceable between a ready-to-fire position with the rear end of said piston located in the rear end of said barrel and a fired position with the rear end of said piston displaced axially toward the front end of said barrel, a guide bush located in said housing at the rear end of said barrel and being coextensive with and laterally enclosing an axially extending portion of said barrel extending from the rear end thereof, said guide bush forming a combustion chamber in communication with said bore in said barrel, said barrel is rotatably supported in said housing for rotational displacement relative to said guide bush, wherein the improvement comprises that said barrel has at least one outlet opening extending therethrough adjacent the rear end thereof and in the region where said barrel and said guide bush are coextensive, said guide bush has an outlet flow duct in communication with the atmosphere exterior of said housing, said at least one outlet opening in said barrel is selectively placeable into and out of flow communication with said outlet flow duct in said guide bush when said driving piston is in the ready-to-fire position for regulating the power output of the powder charge directed against said driving piston.

4,577,794

RIVET INJECTOR/REJECTOR DEVICE

Thomas E. Armstrong, Issaquah; Douglas L. Boob, Kent; Homer R. Burrous, Bellevue; Oldrich Fryc, Renton, and David L. Wagner, Kent, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 7, 1984, Ser. No. 679,238
Int. Cl.[4] B21J *15/28, 15/32*
U.S. Cl. 227—119 **8 Claims**



1. A rivet injector/rejector apparatus for use with a riveting machine having a plurality of rivet gripping fingers that are movable back and forth between the injector/rejector and a workpiece, the fingers being spreadable relative to each other and having surfaces for gripping a shank portion of a rivet received from the injector/rejector, the gripping surfaces holding the rivet while it is delivered from the injector/rejector to the workpiece, the apparatus comprising:

a supporting member mounted fixedly to said riveting machine;

a tubular member for delivering the rivet to the fingers, the tubular member having an end portion that is positioned and shaped to spread the fingers when the fingers are moved toward the injector/rejector and against the end portion, for the purpose of injecting a rivet into a region between the fingers that is adjacent their shank gripping surfaces, the tubular member being connected to the supporting member in a manner so as to permit downward movement of the end portion relative to the fingers; and

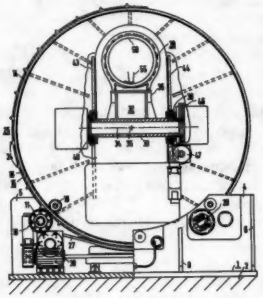
means for moving the end portion downwardly relative to the fingers, to reject a rivet from the fingers during certain conditions, and wherein the end portion is shaped for sufficiently spreading the fingers during such downward movement so that a received rivet is rejected free of the fingers by dropping therefrom.

4,577,795

DEVICE FOR OVERLAY-WELDING PIPES BENDS

Siegfried Förner, Erlangen; Karl-Heinz Langhammer, Berlin; Dieter Pellkofer, Herzogenaurach, and Wolfgang Nahr, Erlangen, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Dec. 24, 1984, Ser. No. 685,299
Claims priority, application Fed. Rep. of Germany, Dec. 28, 1983, 3347319
Int. Cl.[4] B23K *5/18, 9/04, 31/02, 37/04*
U.S. Cl. 228—29 **10 Claims**



1. Device for overlay-welding a pipe interior having an arm extensible into the interior of a respective pipe, the arm carrying a welding head at a free end thereof, comprising a rotating device in the form of a wheel surrounding and supporting the pipe, and swiveling means disposed in said wheel for moving the pipe in a circular arc about the center of said wheel and transversely to the plane of said wheel, the arm being curved and being secured to a part of said swiveling means connected to said wheel, said welding head being rotatable in the plane of said wheel for overlaywelding pipes formed at least partly with a bend therein.

4,577,796

METHOD AND APPARATUS FOR TRACKING SEAM WELDS ON PIPES AND THE LIKE

Joseph E. Powers, and Calvin C. Williamson, both of Napa, Calif., assignors to Kaiser Steel Corporation, Fontana, Calif.

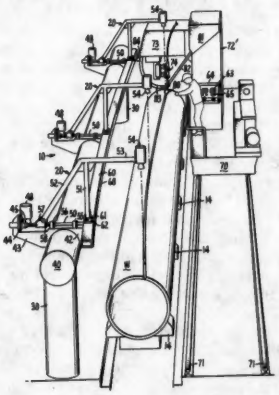
Filed Oct. 10, 1984, Ser. No. 658,992
Int. Cl.[4] B23K *37/02, 5/02, 11/30*
U.S. Cl. 228—102 **9 Claims**

1. A method for automatically tracking an inside weld seam of a large diameter thick guage steel pipe in order to apply an outside weld seam thereto in precise alignment with said weld seam which comprises,

optically scanning said weld seam at intermediate stations along the length of said pipe section,

adjusting the position of said optical scanning means for precise positioning with respect to the center of said intermediate weld seam as scanned at a particular point by adjusting the position of the support for said optical scanner and thereby moving a flexible girder guide means attached to said support and extending generally parallel to said pipe section to thereby deflect said beam sufficiently to enable said guide means to assume a contour corresponding to the contour of said weld seam.

and thereafter applying the outside weld over said weld seam by causing a welding machine to traverse the length



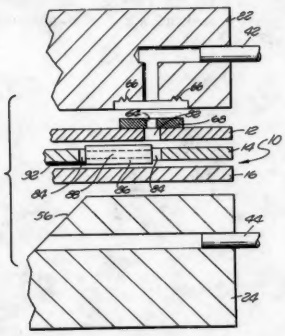
of said pipe section by using said flexible box beam as a guide for said outside weld seam path.

4,577,797

APPARATUS AND METHOD FOR MAKING LAMINATE STRUCTURES

Roger S. Raymond, Redondo Beach, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 21, 1984, Ser. No. 592,044
Int. Cl.⁴ B23K *1/20*
U.S. Cl. 228—118 **13 Claims**



11. A method of making laminate structure between first and second forming members with the use of pressurized fluid from a first sheet made of a first sheet material and a second sheet made of a second sheet material, said second sheet material being the same or different from said first sheet material, which comprises:

positioning said first sheet and said second sheet into a stack;

applying a stopoff material at preselected areas of opposing surfaces of said sheets;

positioning said stack between said forming members;

providing a slot in one of said sheets at a predetermined position adjacent to said stopoff material;

providing a fluid line in said forming member that is coupled to said slot, said line allowing pressurized fluid to flow into said slot;

providing a ceramic inflation tube having an internal bore within said slot, said tube being thicker than said one of said sheets having the slot, said tube having a compressive strength of at least about 3000 psi, the compressive strength being sufficient to enable said tube to form a groove in at least one of the sheets with application of diffusion bonding pressures, a portion of said tube snugly fitting within the groove, said tube being positioned in said slot such that it provides fluid communication from said prssurized fluid to said stopoff material, said ceramic being noncontaminating relative to said first sheet material and said second sheet material;

sealing said first forming member about said slot; and

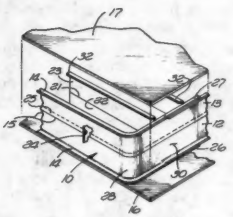
applying heat and differential pressure to inflate said stack to form said laminate structure.

4,577,798

METHOD OF FABRICATING EXPANDED SANDWICH PANELS HAVING AN ENCLOSED CORE

Gilles Rainville, Northridge, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 21, 1983, Ser. No. 553,661
Int. Cl.⁴ B23K *31/00*
U.S. Cl. 228—157 **12 Claims**



1. A method of forming a sandwich structure with a core close-out, comprising:

providing two face sheets, each face sheet having two opposed principal surfaces;

providing at least one core sheet, said at least one core sheet having two opposed principal surfaces;

providing at least one set of close-out sheets, each sheet of said set having two opposed principal surfaces, and having substantially the same shape, each of said close-out sheets having a pair of elongated lip portions, each of said close-out sheets having a central hole;

positioning said sheets in a stack, contacting at said principal surfaces, such that said central holes of said close-out sheets are in alignment and said face sheets sandwich said close-out sheets and said at least one core sheet, said at least one core sheet being positioned within said central holes of said close-out sheets such that said close-out sheets substantially frame said at least one core sheet;

joining one of said lip portions from each of said close-out sheets together;

joining said other lip portion from each of said close-out sheets to the respective contacting face sheet;

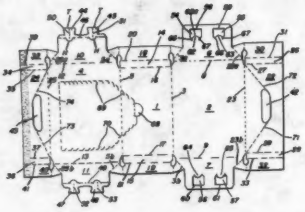
joining at selected areas said at least one core sheet to said face sheets; and

expanding the joined stack such that the core of said sandwich structure is formed by said at least one core sheet and said close-out sheets unfold into a core close-out that extends continuously around the periphery of the core.

4,577,799
PANEL INTERLOCKING MEANS

James R. Oliff, Austell, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Jan. 28, 1985, Ser. No. 695,184
Int. Cl.[4] B65D 5/08
U.S. Cl. 229—40 4 Claims

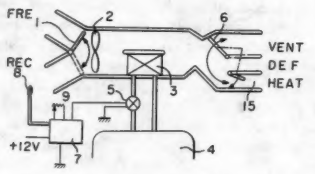


1. Interlocking means for securing two end wall panels of a carton together in overlapping relation, said interlocking means comprising a locking tab joined to one of the panels along a first fold line and having an integral locking toe and an integral locking heel extending in opposite directions from said first fold line and generally transverse thereto, weakened fold line formed in said locking tab generally transverse to said first fold line, a locking aperture formed in the other panel and having a locking edge for engaging said locking heel upon insertion of said locking heel into said locking aperture in coordination with folding of said locking tab along said first fold line out of the plane of said one panel and relative movement of the panels toward each other, and said locking toe being of a size and configuration such that said locking toe is wider than the width of said aperture so that swinging movement of said locking tab causes at least one side edge portion of said locking toe to overlap a corresponding part of said other panel and so as to fold said locking tab along said weakened fold line, and a holding tab formed integrally with said other panel and disposed opposite said locking edge and having an arcuate end portion projecting inwardly into said locking aperture for engaging the outer surface of the extremity of said locking tab in flat face contacting relation thereby to aid in holding said locking tab in locked condition.

4,577,800
AIR CONDITIONING DEVICE FOR A VEHICLE

Kazuhide Yuchi, Shizuoka, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 523,581, Aug. 16, 1983, abandoned.
This application Feb. 19, 1985, Ser. No. 701,812
Claims priority, application Japan, Aug. 19, 1982, 57-143805
Int. Cl.[4] G05D 23/00
U.S. Cl. 237—2 A 4 Claims



1. An air conditioning device for a vehicle adapted to feed a cooling liquid for cooling an engine to a hot water coil provided in a vehicle cabin and to control temperature of the vehicle cabin which comprises:

(a) a blower means which sucks at least internal air in said vehicle from an intake port and flows out from a foot-spot diffuser provided in said vehicle cabin a hot air which is heated during its passing through a hot water coil for heating placed in an air passage;

(b) an ON-OFF interruption means for interrupting intermittently flow of the cooling liquid fed into said hot water coil for heating;

(c) a first temperature sensor for detecting temperature of air in said vehicle cabin to be air-conditioned;

(d) a second temperature sensor for detecting temperature of air blown from said foot-spot diffuser;

(e) a reference temperature setting means for a cabin which allows manually setting of temperature for air-conditioning said vehicle cabin;

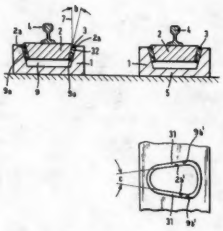
(f) a reference temperature setting means for a passenger's feet region which allows predetermination of temperature of air blown from said foot-spot diffuser; and

(g) a controlling unit comprising a first comparator for comparing a signal from said first temperature sensor with a set signal from said reference temperature setting means for a cabin, a second comparator for comparing a signal from said second temperature sensor with a set signal from said reference temperature setting means for a passenger's feet region and a driving circuit for driving said ON-OFF interruption means by receiving output from said first and/or second comparator, whereby said vehicle cabin is air-conditioned and said ON-OFF interruption means is controlled to keep the temperature of air blown from said foot-spot diffuser to be maintained at a predetermined minimum temperature regardless of the result of the comparison of said first comparator so as to keep the feet of the passengers comfortable.

4,577,801
ELASTOMERIC MOUNTING FOR RAILWAY RAIL WITH DIFFERENTLY ANGLED FLANKS

Hermann Ortwein, Cologne, Fed. Rep. of Germany, assignor to Clouth Summiwerke Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Aug. 14, 1981, Ser. No. 292,789
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1980, 3030937
Int. Cl.[4] E01B 9/38
U.S. Cl. 238—283 9 Claims



1. A mounting for one rail of a pair of railroad rails having inner sides turned toward each other and outer sides turned away from each other, said mounting comprising:

a base supported on the ground under said one rail and formed with an upwardly open recess having inner and outer base side flanks respectively generally under and parallel to said inner and outer sides and end base flanks extending between said side base flanks and transverse to said rail, said side flanks forming with the vertical an angle different from that of said end flanks;

an insert attached to said rail, received in said recess, and having respective side and end insert flanks juxtaposed with, generally parallel to, and spaced from the respective base flanks; and

respective side and end elastomeric bodies lying between

said base and insert flanks and supporting said insert in said recess of said base.

4,577,802

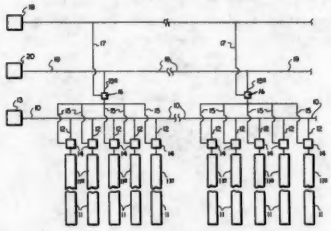
METHOD AND SYSTEM FOR FURROW IRRIGATION

Jack Keller, Logan, and Glen E. Stringham, Millville, both of Utah, assignors to Utah State University Foundation, Logan, Utah

Continuation of Ser. No. 651,048, Sep. 14, 1984, abandoned, which is a continuation of Ser. No. 61,693, Jul. 30, 1979, abandoned. This application Aug. 6, 1985, Ser. No. 763,314

Int. Cl.[4] B05B *17/04;* A01G *25/16;* E02B *13/00*

U.S. Cl. 239—11 **15 Claims**



1. An intermittent flow irrigation method for advancing irrigation water down a furrow, the method comprising the steps of:

advancing irrigation water down a portion of the length of the furrow using an on/off irrigation cycle comprising the steps of:

supplying a continuous flow of irrigation water into a head end of the furrow during a first predetermined time period such that the irrigation water advances down a portion of the length of the furrow; and

refraining from supplying irrigation water into the furrow during a second predetermined time period, thereby allowing the irrigation water supplied to the furrow during the first predetermined time period to seep into the furrow; and

repeating the on/off irrigation cycle so as to advance the irrigation water further down the length of the furrow, the on/off irrigation cycle being repeated until the water extends to substantially near a bottom end of the furrow.

4,577,803

CONTAINERS

David J. Owen, Cleveland, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Feb. 7, 1984, Ser. No. 577,883

Claims priority, application United Kingdom, Mar. 2, 1983, 8305816

Int. Cl.[4] B05B *5/02*

U.S. Cl. 239—690 **9 Claims**

1. A combination, comprising:

(a) a container having:

(i) a body enclosing a reservoir,

(ii) a nozzle providing an orifice for dispensing a fluid from said reservoir,

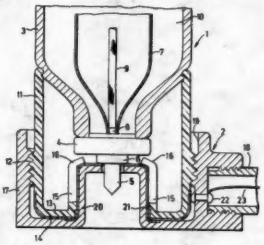
(iii) a valve, biassed to the closed position, between said reservoir and said orifice,

(iv) a valve operating member incorporating said nozzle, said valve being actuatable by effecting predetermined relative movement between said valve operating member and said body, and

(v) at least one sprung member biassed to engage with said valve operating member to prevent said predetermined relative movement, and

(b) an enabling device connectable to said container and provided with:

(i) first engaging means for engaging with said at least one



sprung member to urge the latter out of engagement with said valve operating member, and

(ii) an opening through which said nozzle is exposed when said enabling device is connected to said container.

4,577,804

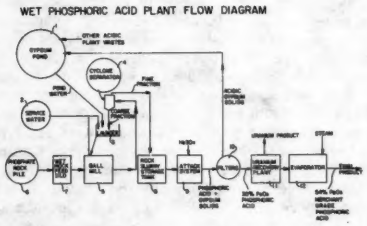
WET GRINDING PHOSPHATE ROCK IN AN ACIDIC SLURRY

Vivian C. Astley, New Orleans, La.; Rudolph R. Milan, Albany, Calif., and Jody J. Taravella, Harvey, La., assignors to Freeport Minerals Company, New York, N.Y.

Filed Aug. 7, 1984, Ser. No. 638,420

Int. Cl.[4] B02C *23/36*

U.S. Cl. 241—16 **16 Claims**



1. A method for grinding phosphate rock with mild steel grinding balls in an acidic slurry comprising:

(a) establishing control curves relating three variables of said slurry, said variables being:

(i) pH;

(ii) particulate iron content; and

(iii) ball consumption;

(b) determining particulate iron content in said slurry after a period of operation of said mill;

(c) correlating said particulate iron content to said control curve; and

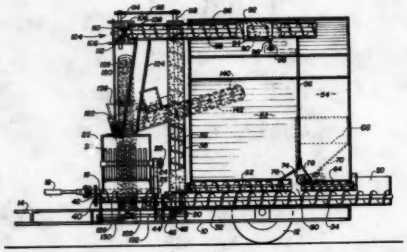
(d) adjusting said slurry variables of pH by altering a blend of low pH pond water and a substantially neutral pH service water togehter which form an aqueous phase of the acidic slurry, and particulate iron content to an extent required to produce a predetermined ball consumption rate.

4,577,805

AGRICULTURAL MIXING AND GRINDING MACHINE

Shaun A. Seymour, New Holland, Pa., assignor to Sperry Corporation, New Holland, Pa.

Filed May 31, 1984, Ser. No. 615,616
Int. Cl.[4] B02C *19/00*
U.S. Cl. 241—101 B 10 Claims



1. An agricultural mixing and grinding machine comprising in combination, a frame having forward and rearward ends and supporting a plurality of bins for different agricultural materials, material receiving means on said frame comprising a hopper adjacent the rearward end of said frame, delivery means on said frame operable to move material from said receiving means and distribute the same selectively to said bins, said delivery means including a confluence mixing auger located below said bins and extending longitudinally of said frame, metering augers respectively positioned to receive individual materials from said bins and discharge measured quantities thereof to said confluence mixing auger, adjustable drive means for each of said metering augers operable to selectively and respectively drive the same at variable independent speeds in desired ratios to each other to provide desired proportions of materials in the final mixed product grinding means on said frame adjacent said forward end of said frame positioned to receive said mixed material from said confluence mixing auger, discharge means on said frame arranged to receiving mixed and ground material from said grinding means and to discharge it from said machine, said delivery means also including an upper distributing auger extending along the upper portions of said bins and arranged to distribute material thereto from an elevating auger communicating with the delivery end of said confluence mixing auger, said upper distributing auger also having a portion extending toward said grinding means, and reversible drive means for said upper distributing auger operable selectively to drive said upper distributing auger in one direction to deliver unmixed material to said bins from said hopper when said metering augers are idle and to drive said upper distributing auger in another direction to deliver mixed material to said grinding means when said metering augers are operating.

4,577,806

IMPELLER ASSEMBLY FOR AN IMPACT CRUSHER

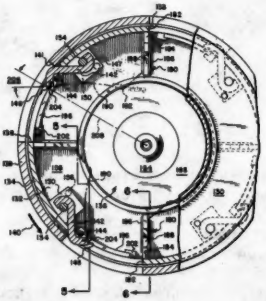
Gabriel M. Terrenzio, Seattle, Wash., assignor to Acrowood Corporation, Everett, Wash.

Filed Nov. 18, 1983, Ser. No. 553,222
Int. Cl.[4] B02C *17/20*
U.S. Cl. 241—275 6 Claims

1. An impeller assembly for use in a centrifugal impact rock crusher, comprising:

a rotatable cylindrical impeller housing with a vertically disposed central rotary axis, said housing having an upper impeller unit which has a feed opening disposed coaxially with said housing for receiving rock, said housing also having a lower impeller unit which has a landing surface disposed coaxially with said housing for ipingement on said landing surface of rock being fed through said feed opening, said impeller units being connected to each other by a generally cylindrical side wall unit which has a plurality of exit openings spaced around said side wall unit, each of said exit openings having an upper opening edge, a bottom opening edge, and two opposing side opening edges, wherein rotation of the impeller housing about said axis defines one of said side opening edges of each of said exit openings of each of said exit openings as a forward side edge and the other of said side edges as a rearward side edge with respect to the direction of rotation of the impeller housing;

lip means including a plurality of removable lip providing members disposed within respective of said exit openings and being disposed adjacently the rearward side edge thereof, each of said lip members having first and second ends spaced apart circumferentially around said side wall unit, and each of said lip members being formed with a generally right-angle bend near said first end, a curved



bend near said second end and directed oppositely to said generally right-angle bend, and a central portion between said generally right-angle bend and curved bend said generally right-angle bend defining a lip portion adjacent said first end, seid lip portion having inner and outer lip surfaces with respect to bend, said generally right angle said inner lip surfaces extending substantially the full height of a respective exit opening and being directed generally inwardly with respect to said cylindrical side wall unit for facilitating retention of a portion of rock to be crushed to thereby protect the rearward side edge of each exit opening, and an outer surface of said central portion being placed adjacently the rearward side edge of it respective opening; and

retaining means for each lip providing member, said retaiing means including said curved bend ad a vertical column attached between said upper and lower impeller units near said side wall unit and partially surrounded and engaged by the curved bend of the lip member.

4,577,807

OPEN FACE ROTATABLE SPOOL FISHING REEL

Charles L. Urso, 215 Newton St., Waltham, Mass. 02154

Continuation-in-part of Ser. No. 558,821, Dec. 7, 1983, abandoned. This application May 20, 1985, Ser. No. 736,424
Int. Cl.[4] A01K *89/015, 89/04*
U.S. Cl. 242—84.2 C 7 Claims

1. A fishing reel comprising:

a spool positioned with an open end such that line wound upon the spool can pay-off longitudinally of the spool axis during a line cast;

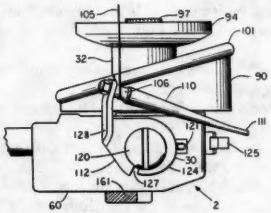
a line traversing cam, encircling the spool, comprising a support cup and an endless rail of substantially elliptical circuit configuration fixedly mounted to the support cup at an oblique angle relative to the spool;

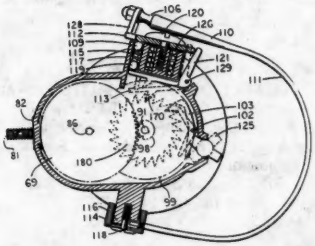
a stationary housing;

means for rotatably mounting the spool and the line cam to the housing about a common axis;

a hand crank rotatably supported by the housing;

means for drivingly connecting the crank with the spool and the line cam such that rotation of the crank compels the





spool and the line cam to rotate such that the rotation rate of the spool is greater than the rotation rate of the line cam; and

a line pick-up mounted to the housing, adjacent the line cam, the line pick-up being movable between a line engaged retrieval position and a line disengaged casting position.

4,577,808

SPINNING REEL BRAKE

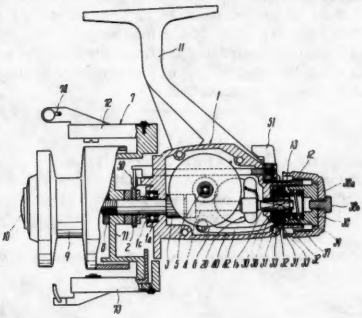
Yuzo Kawabe, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Feb. 8, 1984, Ser. No. 578,105

Claims priority, application Japan, Feb. 16, 1983, 58-21420[U]

Int. Cl.⁴ A01K *89/01, 89/02*

U.S. Cl. 242—84.5 R **2 Claims**



1. A spinning reel comprising:

a reel body;

a spool shaft having a spool supported thereon, said spool shaft rotatably supported to said reel body and movable longitudinally of said body;

a line-winding mechanism for winding a fishing line onto said spool; and

a drag mechanism comprising a first drag washer supported non-rotatably to said spool shaft, a second drag washer supported non-rotatably to said reel body, and a lining plate interposed between said first and second drag washers, said first drag washer comprising a tubular holding portion disposed at a central position of said first drag washer, said tubular holding portion having a non-circular through bore, said first drag washer being supported to said spool shaft by said tubular holding portion, said drag mechanism further including a rotary cylinder supported rotatably to said reel body, said rotary cylinder comprising a non-circular inner peripheral surface having a non-circular cross-section and a non-circular outer peripheral surface having a non-circular cross-section, said spool shaft being inserted into said rotary cylinder such that said spool shaft and said rotary cylinder are axially movable relative to each other but are not rotatable relative to each other, and said tubular holding portion being supported to said outer peripheral surface of said rotary cylinder such that said tubular holding portion and said rotary cylinder are axially movable relative to each other but are not rotatable relative to each other, said tubular holding portion being longer in axial length than a widthwise thickness of said lining plate, said lining plate and said second drag washer being supported on an outer periphery of said tubular holding portion, said drag mechanism further comprising first and second sets of drag components, each set comprising a said first drag washer and a said second drag washer and a said lining plate interposed therebetween, said second set comprising a said first drag washer having a projection abutting against a said second drag washer of said first set, a said tubular holding portion of said first drag washer of said first set being longer than a combined thickness of said second drag washer of said first set and a said lining plate of said first set.

4,577,809

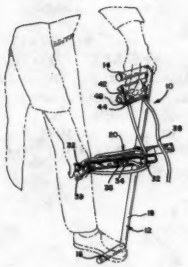
GATHERING AND STORING DEVICE FOR ELECTRIC CABLE

William F. Auer, 1654 Walnut, DesPlaines, Ill. 60016

Filed Feb. 27, 1985, Ser. No. 706,197

Int. Cl.⁴ B65H *75/40*

U.S. Cl. 242—96 **6 Claims**



1. A portable, manually operated cord gathering and storage device for an extension cord and the improvement comprising:

a frame member providing a handle to be grasped by a user;

a reel rotatably mounted on the frame member below said handle and also including a grasping portion for rotating the reel to gather and store said extension cord;

a slack adjuster with manually operated means aligned with the reel as it rotates cooperating with an associated tension

roller to contact said extension cord and apply tension as the cord moves from the roller and is being gathered on the reel;

said manually operated means of said slack adjuster including a pressure plate with a hand engaging portion and also including a cord engaging lip; and

guide means operating in conjunction with the slack adjuster to insure proper positioning of the cord on said reel.

4,577,810

FEED DEVICE FOR GUIDING A ROPE ONTO A WINDING DRUM

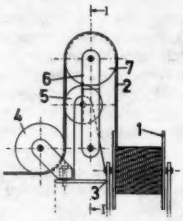
Johannes Sandvik, Stokke, Norway, assignor to Elkem A/S, Oslo, Norway

Filed Sep. 18, 1984, Ser. No. 652,177

Claims priority, application Norway, Sep. 26, 1983, 833449

Int. Cl.[4] B65H *57/28*

U.S. Cl. 242—157.1 **4 Claims**



1. A device for guiding rope comprising:

(a) a frame;

(b) a drum rotatably mounted on said frame for receiving said rope;

(c) a frame pulley mounted on said frame;

(d) a first guide pulley mounted on said frame between, with respect to the movement of said rope, said frame pulley and said drum, and such that said rope runs vertically between said frame pulley and said first guide pulley;

(e) an arm, one end of said arm being pivotally mounted to said frame at a point on said frame below the mounting point of said first guide pulley; and

(f) a second guide pulley mounted at the other end of said arm such that the axis of said second guide pulley is substantially perpendicular to a vertical plane which is parallel to the axis of said drum, said second guide pulley guiding said rope on to said drum when said rope is wound onto said drum.

4,577,811

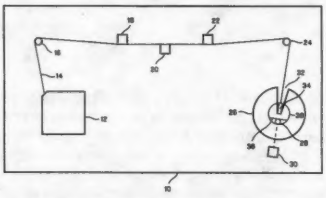
TAPE REEL POSITION SENSOR

Stuart W. Bray; Timothy C. Hughes, and Susan E. Ariniello, all of Boulder County, Colo., assignors to Storage Technology Corporation, Louisville, Colo.

Filed Feb. 28, 1985, Ser. No. 706,553

Int. Cl.[4] G03B *1/04;* **G11B** *15/32*

U.S. Cl. 242—195 **13 Claims**



5. In a magnetic tape device having an automatic tape threading mechanism using a tape leader block, apparatus for positioning a machine reel of said device for proper insertion and removal of said leader block into a slot in a hub of said machine reel, comprising;

rotating means for rotating said machine reel in winding and unwinding directions;

reflective means attached to said hub of said machine reel and being positioned such that tape wound on said machine reel will block light from reaching said reflective means;

a light source mounted adjacent said machine reel for directing light at said reflective means;

light detection means for receiving light from said reflective means; and

controller means attached to said light detection means and said rotating means for rotating said machine reel until light is detected by said light detection means;

whereby said machine reel is rotated in an unwinding direction until said reflective surface is uncovered and said reel is further rotated until light from said light source is detected by said light detection means whereupon said machine reel rotation is stopped thereby positioning said machine reel in a proper position to remove or insert said leader block.

4,577,812

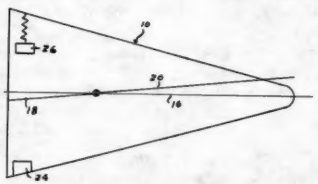
CENTRIFUGALLY OPERATED MOVING-MASS ROLL CONTROL SYSTEM

Daniel H. Platus, Los Angeles, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 26, 1973, Ser. No. 398,281

Int. Cl.[4] F41G *7/00*

U.S. Cl. 244—3.21 **1 Claim**



1. A roll control system for a reentry missile comprising: means for offsetting the center of gravity from the aerodynamic axis of said missile; a roll control mass assembly positioned at the aft end of said missile within the heat shield; said roll control mass assembly including means for tilting the principal axis of inertia of said missile in a plane orthogonal to the center of gravity offset of the missile; said tilting means including means for controlling the tilt of the principal axis of inertia as a function of roll rate of said missile at a predetermined level above the critical roll rate.

4,577,813

DISCUS-SHAPED PROJECTILE

Rudolf Romer, Kaarst, and Manfred Moll, Düsseldorf, both of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Dusseldorf, Fed. Rep. of Germany

Filed May 5, 1980, Ser. No. 153,921

Claims priority, application Fed. Rep. of Germany, May 7, 1979, 2918129

Int. Cl.[4] F42B *13/24*

U.S. Cl. 244—3.23 **10 Claims**

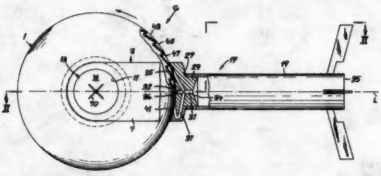
1. A weapons system, especially for foot attack upon armored vehicles, comprising a discus-shaped projectile, said projectile comprising:

a fork having an upper arm and a lower arm;

a stabilizer connected to said fork and including a tube having a longitudinal axis;

an explosive charge carried by said fork;

a disk-shaped body rotatable between the arms of said fork; and



means for directing a portion of propellant gases from said tube against said body for rotating said body to stabilize the projectile along its flight toward a target.

4,577,814

VARIABLE SECTION NOZZLE FOR A TURBO-JET ENGINE AND AN AIRCRAFT COMPRISING SUCH EQUIPMENT

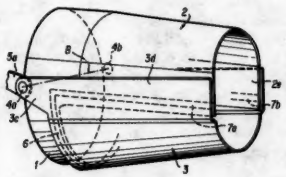
Gérard J. P. Bayle-Laboure, Avon; Jean G. Bouiller, Brunoy; Marc F. B. Buisson, Le Mee sur Seine, and Marcel R. Soligny, Chevilly-Larue, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.-M.A.", Paris, France

Filed Nov. 22, 1983, Ser. No. 554,301

Claims priority, application France, Dec. 8, 1982, 82 20530

Int. Cl.[4] B64C *15/00*; F02K *1/00*

U.S. Cl. 244—12.5 **9 Claims**



1. A variable section nozzle for a turbo-jet engine comprising

means defining a substantially frusto-conical convergent duct including

a fixed semi-shell arranged to be secured to the jet pipe of an aircraft engine,

a pivotal semi-shell mounted for pivotal movement about a diametral axis transverse to the longitudinal axis of the jet pipe,

the semi-shells together defining the nozzle and having generally coincident longitudinal edge portions in opposed pairs, said longitudinal edge portions of both of said shells being plane and overlapping, and

means for ensuring fluid-tightness of the semi-shells at the longitudinal edge portions in all poritions of the pivotal semi-shell, and including

means for pivoting the pivotal semi-shell between two extreme positions corresponding to maximum and minimum openings of the nozzle.

4,577,815

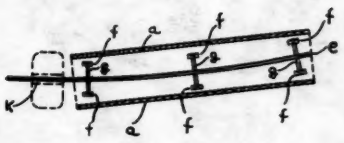
WING ASSEMBLIES FOR AIRCRAFT

Paul Orazi, Box 32, Miami Beach, Fla. 33139

Continuation-in-part of Ser. No. 97,342, Nov. 26, 1979, abandoned. This application Aug. 12, 1982, Ser. No. 407,550

Int. Cl.[3] B64C *3/00*

U.S. Cl. 244—39 **29 Claims**



1. A rotary wing assembly for an aircraft, said assembly comprising a spar intended to be rotatably mounted upon an aircraft fuselage, and wing sheets forming flying surfaces and floating upon a frame including said spar, whereby during rotation of the wing assembly the said spar can flex without transmission of corresponding flexural movement to the wing sheets, the wing sheets cooperating with the frame to achieve the flexing of the spar while maintaining an internal clearance between said frame and said wing sheets.

4,577,816

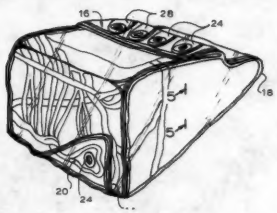
VACUUM-PACKED SURVIVAL EQUIPMENT

Gordon T. Foster, La Habra, Calif., assignor to Gulf & Western Manufacturing Company, Southfield, Mich.

Continuation-in-part of Ser. No. 318,328, Nov. 5, 1981, abandoned. This application Aug. 22, 1983, Ser. No. 525,574

Int. Cl.[4] B64D *17/40*

U.S. Cl. 244—148 **17 Claims**



1. A vacuum-packed assembly comprising:

a compressible article of survival equipment;

a first flexible, substantially gas-impermeable envelope of relatively thin material encasing said compressible article, said article being compressed to a significant degree, said first envelope having sufficient size to receive said article in its uncompressed state and being evacuated to form a skin-tight covering about said compressed article, there being a considerable amount of excess first envelope material drawn against said compressed article; and

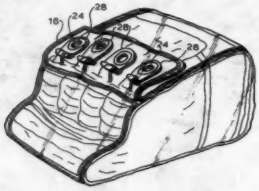
a second flexible, substantially gas-impermeable envelope of relatively thicker material than said first envelope, having a smaller volume than said first envelope and having greater resistance to punctures, said second envelope encasing said compressed article and said first envelope and being evacuated to form a skin-tight covering thereabout.

4,577,817

THREE-DIMENSIONAL VACUUM ENVELOPE

Santiago Hernandez, Anaheim, Calif., assignor to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed Dec. 14, 1983, Ser. No. 561,415
Int. Cl.[4] B64D *17/50*
U.S. Cl. 244—148 **16 Claims**



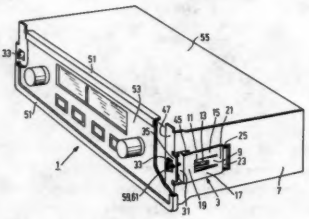
1. A three-dimensional vacuum container comprising upper and lower walls of flexible, substantially gas-impermeable material, said upper and lower walls being secured to each other along opposing sealing lines and defining a first envelope portion, said upper wall including an integral loop therein defining a second envelope portion in fluid communication with said first envelope portion, said loop having a closed end and a pair of opposing sealed edges, each of said sealed edges extending between said closed end and said first envelope portion with at least one of said sealed edges positioned between said opposing sealing lines, said second envelope portion being pivotable with respect to said first envelope portion along a line at which it adjoins said first envelope portion such that it may be positioned against said upper wall upon being pivoted about an axis defined by said line.

4,577,818

APPARATUS ADAPTED TO BE MOUNTED IN A MOUNTING WALL

Eddy J. Clarisse, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 16, 1984, Ser. No. 672,442
Claims priority, application Netherlands, Nov. 17, 1983, 8303946
Int. Cl.[4] G12B *9/00*
U.S. Cl. 248—27.3 **7 Claims**



1. An apparatus having means for mounting in an opening in a mounting wall by engaging inner and outer surfaces of the wall, comprising a flange formed on the apparatus, and a mounting spring mounted on a wall of the apparatus, said mounting spring being resilient in a direction transverse to the insertion direction and having a shoulder arranged for clamping a part of the mounting wall against the flange,

characterized by comprising means for guiding the mounting spring slidably on said apparatus wall in a direction parallel to said insertion direction,

a bolt having a shoulder, and

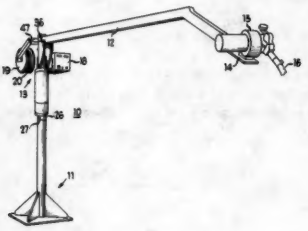
screw thread means for connecting the bolt to the spring shoulder, arranged such that, when the apparatus is mounted in a mounting wall, the bolt pulls the apparatus flange and the mounting spring shoulder toward each other so as to clamp the apparatus flange and part of the mounting wall between the shoulder on the bolt and the shoulder of the mounting spring.

4,577,819

SELF-BALANCING BOOM APPARATUS

Richard C. Bennett, 7333 Armitage Ave., Elmwood Park, Ill. 60635

Filed May 14, 1984, Ser. No. 610,127
Int. Cl.[4] F16L *3/00*
U.S. Cl. 248—123.1 **22 Claims**



10. A self-balancing boom apparatus comprising a vertically extending support member, a boom pivotally mounted near its proximal end to said support member for movement about a pivot axis, and adapted to carry a load at its distal end, and balancing means for counteracting downward force at the distal end of said boom and including spring means and spring force coupling means, said spring means being carried by said support member and producing a force which is directed along a force axis, said spring force coupling means being constructed and arranged to apply the spring force to said boom at a point located between the pivot axis and the distal end of said boom, said spring force coupling means including a cam member and a cam follower, said cam member being coupled to said spring means and defining a cam surface, said cam follower being fixed to said boom at the point of application of the spring force and engaging said cam surface, said cam member being movable relative to said support member as said boom is pivoted to vary the force produced by said spring along the force axis while cooperating with said cam follower to vary the distance between the force axis and the point of application of the spring force to said boom whereby the moment of the force exerted on said boom by said spring means is maintained substantially constant as said boom is pivoted.

4,577,820

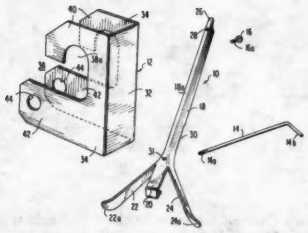
PAINT PAIL HOLDER AND WOODEN LADDER ADAPTOR FOR SAME

Jeffrey J. Michaud, Bellows Falls, Vt., assignor to J. D. Tools, Inc., Bellows Falls, Vt.

Filed Jul. 13, 1984, Ser. No. 630,602
Int. Cl.[4] E06C *7/14*
U.S. Cl. 248—211 **9 Claims**

1. A paint pail holder for supporting an open paint pail having an internally flanged rim to the side of an aluminum type ladder having hollow rungs opening through side rails of the ladder at both ends thereof; said holder comprising: an elongated sheet metal bar of inverted V-shaped cross-section sized to slide freely at one end into a given hollow run of said ladder, the opposite end of said bar being bifurcated to form outwardly flared wings, and a downwardly facing, integral hook projecting between the bifurcated wings at said other end, said hook being engageable with the rim of the paint pail with said wings contacting the outside of said pail below said rim to securely grasp the pail and hold it in upright, open position; and wherein the edges of said inverted V-shaped

cross-section sheet metal bar at the end adjacent the bifurcation engages the edges of the open end of said rung within which said bar is inserted; and wherein the apex of the inverted V-shaped cross-section sheet metal bar remote from said bifur-



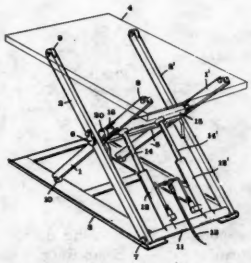
cation projects upwardly towards the top of said hollow rung to effect frictional contact at the end to the top of said hollow rung interior, such that the weight of the paint pail and its contents causes effective frictional locking between said elongated sheet metal mounting bar and said hollow rung.

4,577,821

LIFTING TABLE

Torbjörn Edmo, Härnösand, and Per-Olof Sehlstedt, Ålandsbro, both of Sweden, assignors to Torbjörn Edmo AB, Härnösand, Sweden

Filed Aug. 14, 1984, Ser. No. 641,307
Claims priority, application Sweden, Aug. 29, 1984, 8304655
Int. Cl.[4] B66F 3/22
U.S. Cl. 248—421 **6 Claims**



1. Lifting table comprising two pairs of scissor arms, each pair having an inner arm and an outer arm pivotally interconnected by means of a joint or an axle and adapted to cooperate in raising and lowering a table or the like in relation to an underlying base portion by means of at least one longitudinally extensible power transmission device, for example a hydraulic cylinder, positioned in the area between the inner scissor arms, the scissor arms having ends which extend backwards from the joint and which are fixedly but hingedly connected to the table and the base portion, respectively, whereas the opposite ends of the arms are movable, for example by rollers or wheels, along the base portion and the table, respectively, and a carrier member, coupled with the power transmission device transversely of the longitudinal direction thereof, being inserted through an oblong hole in an inner scissor arm and adapted to cooperate with a sloping slideway on the associated outer scissor arm, said slideway being adapted, on displacement of the carrier member from an initial position in which the scissor arms are in one plane, to swing at least the inner scissor arm into a position in which a substantial moment arm has been established between the carrier member and the joint between the scissor arms, wherein the carrier member has the form of a single axle, the two opposite end portions of which protrude through the holes in the two inner scissor arms and which axle is directly coupled with one end of the power transmission device the opposite end of which is connected to a transverse attachment axle extending between the two outer scissor arms, wherein the carrier axle and consequently said slideways are located between the attachment axle and said joints, and wherein the carrier axle includes at least one rotatably mounted pin protruding through the oblong holes and roller-shaped portions that are rotatably mounted on said at least one pin and that are positioned to engage the slideways.

4,577,822

BACKING FOR A PHOTO OR PICTURE FRAME

David T. Wilkerson, Pinner, England, assignor to Masters Wilkerson Manufacturing Co. Ltd., London, England

Filed May 2, 1983, Ser. No. 490,896
Claims priority, application United Kingdom, May 11, 1982, 8213661
Int. Cl.[4] A47B 97/08
U.S. Cl. 248—463 **6 Claims**

5. A back for a photo or picture frame in combination with a strut by means of which the frame can be supported in a display position, and wherein:

said back is a moulded synthetic plastics member having at least one three-sided slot generally coplanar with the back and defining a substantial part of a boundary of a region which can flex relative to the remainder of said back,

said strut is a moulded synthetic plastics member having one end abutting said back, the abutting portion of said one end being inclined or bevelled at an angle which determines the angle of the strut to the back when the frame is stood in a display position and an integrally formed lip or flange extending obliquely from said strut adjacent said one end and on the same side thereof as said abutting portion,

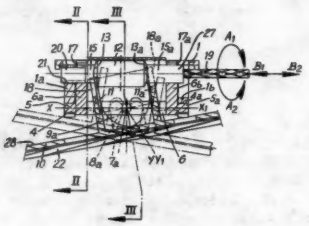
said lip or flange being engaged in said slot with one edge of said slot being embraced between said one end and said lip or flange said engagement being affected by the inward flexing of said region, and a projecting edge on said lip or flange engaging on a second edge of said slot which second edge is a bevelled edge of said flexing region,

said strut being disengageable from said back by swinging the strut across said back to cause said flexing region to flex and disengage said projecting edge from said second edge and thereby release said lip or flange from said slot.

4,577,823
DEVICE FOR REMOTELY CONTROLLING A REARVIEW MIRROR

Stéphane Manzoni, 1, rue Pasteur, 29200 Saint-Claude, France

Filed Jul. 13, 1984, Ser. No. 630,780
Claims priority, application France, Jul. 13, 1983, 83 11758
Int. Cl.[4] B60R 1/06
U.S. Cl. 248—487 8 Claims



1. A control device for positioning a rearview mirror, said control device comprising:

a support member having a front face and a rear face, said rearview mirror being attached to said front face, said support member further having two coupling tabs extending outwardly from said rear face;

a pair of arms affixed to said rear face of said support member, said pair of arms extending outwardly from said rear face;

a spider having two cylindrical lugs defining a first axis of rotation, said two coupling tabs of said support member being mounted to pivot about said first axis, said spider further having two additional cylindrical lugs defining a second axis of rotation substantially located in a plane normal to said first axis of rotation;

a base attached to said two additional cylindrical lugs defining said second axis of rotation, said spider being mounted to said base to pivot about said second axis of rotation;

a shaft rotatably and slidably mounted to said base, said shaft having a free end engaging said spider, a second end rotatably mounted to said spider, and an enlarged center portion between said free end and said second end adapted to engage said base, said pair of arms affixed to said rear face of said support member further communicating with said free end and said second end, respectively, of said shaft such that axial movement of said shaft rotates said support member about said first axis; and

means for rotating said support member about said second axis of rotation such that said support member rotates about said first and said second axis of rotation to provide positioning of said rearview mirror.

4,577,824
FASTENING DEVICE FOR FIXING A BODY TO A STRUCTURAL MEMBER

James B. Druffel, and Joel S. Cohen, both of Oakland, Calif., assignors to Prescolite, Inc., San Leandro, Calif.

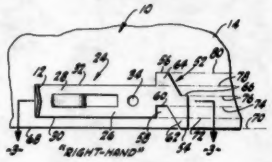
Filed Jul. 9, 1984, Ser. No. 629,209
Int. Cl.[4] F16L 5/00
U.S. Cl. 248—544 6 Claims

1. A fastener for fixing body to a structural member having an edge comprising:

a. an end element connected to the body, said element having a first side and a second opposite side with first and second edges spaced from one another along a certain direction respectively;

b. means for penetrating the structural member said means being connected to said end element;

c. means for guiding the position of said end element in relation to the edge of the structural member, said guiding means including first and second edges each capable of being aligned with the edge of the structural member, said guiding means being formed as a portion of said end element, said first edge of said guiding means lying outwardly from said first edge of said first side of said end

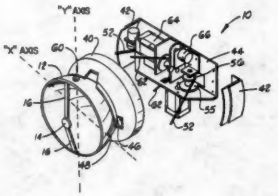


element along said certain direction, and said second edge of said guiding means lying outwardly from said second edge of said opposite second side of said end element along said certain direction.

4,577,825
OCULAR POINTING AND TRACKING DEVICE

George T. Pinson, Huntsville, Ala., assignor to The Boeing Company, Seattle, Wash.

Filed Aug. 12, 1983, Ser. No. 522,604
Int. Cl.[4] F16M 11/12, 13/00
U.S. Cl. 248—550 5 Claims



5. An ocular pointing and tracking device for complete hemispherical scan, the device comprising:

a movable sensor platform adapted for receiving a sensor and the like in the front thereof, the platform conical in shape;

a socket for receiving a portion of the conical sensor platform thereon, the platform rotatably mounted in the socket, the socket attached to support brackets secured to a support beam, the socket further attached to a pair of guide channels for slidably receiving a drive guide, the ends of the guide attached to the sides of the platform;

a Y axis drive motor having Y axis drive belt connected to the ends of the drive guide for rotating the platform around a vertical Y axis, the Y axis drive motor mounted on the support beam;

a Y axis position sensing potentiometer connected to the Y axis drive motor for sensing the movement of the platform around the vertical Y axis;

a X axis drive motor having X axis drive belt connected to the platform for rotating the platform around a horizontal X axis, the X axis drive motor mounted on the support beam; and

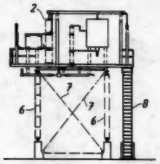
a X axis position sensing potentiometer connected to the X axis drive motor for sensing the movement of the platform around the horizontal X axis.

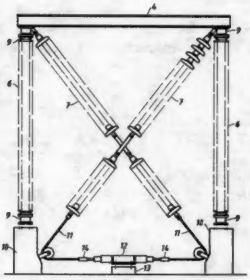
4,577,826

STAND STRUCTURE FOR SUPPORTING ELECTRIC HIGH VOLTAGE EQUIPMENT

Tommy Bergström; Göran Boman, and Leif Englund, all of Västerås, Sweden, assignors to ASEA Aktiebolag, Västerås, Sweden

Filed Jul. 9, 1984, Ser. No. 628,907
Claims priority, application Sweden, Jul. 11, 1983, 8303928
Int. Cl.[4] H02B 5/00; F16F 15/00
U.S. Cl. 248—638 8 Claims





1. A stand structure adapted to support electric high-voltage equipment, said structure comprising:

a platform on which said equipment can be mounted,

a plurality of substantially vertically extending insulator columns carrying said platform,

universal joints at opposite ends of said insulator columns articulately connecting said columns at their top to the platform and at their bottom to column foundations,

bracing means for said insulator columns, said bracing means including insulators which are stretched cross-diagonally between the ends of two adjacent of said insulator columns and interconnected by means of flexible connecting means, and

a spring damper operatively connected to said flexible connecting means, said damper comprising a housing which is fixedly mounted in relation to said column foundations or in relation to said platform.

4,577,827

CAMERA HOLDER APPARATUS

Joshua Eliscu, Tucson, Ariz., assignor to Lois G. Langley, Tucson, Ariz.

Continuation-in-part of Ser. No. 432,076, Sep. 30, 1982, abandoned, which is a continuation-in-part of Ser. No. 275,616, Jun. 22, 1981, abandoned, which is a continuation of Ser. No. 88,414, Oct. 26, 1979, abandoned. This application Jul. 30, 1984, Ser. No. 635,560
Int. Cl.[4] F16M 13/00
U.S. Cl. 248—656 10 Claims

1. Apparatus for holding and positioning a camera, comprising, in combination:

base means;

first plate means rotatable on the base means;

second plate means pivotally secured to and movable with the first plate means;

outer housing means secured to and movable with the second plate means, including

fixed shaft means,

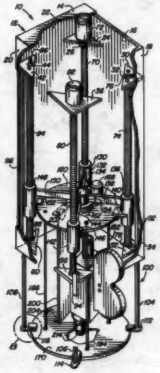
rotating shaft means spaced apart from and aligned parallel to the fixed shaft means, and

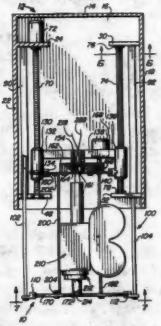
means for supporting the fixed shaft means and the rotating shaft means;

inner housing means disposed in the outer housing means and movable relative thereto in response to rotation of the rotating shaft means, including

bearing means secured to and axially movable on the fixed shaft means and the rotating shaft means, and

third plate means secured to the bearing means, including an upper plate and a lower plate spaced apart from each





other and secured together for longitudinal movement and for rotational movement relative to the inner housing means;

camera means secured to the third plate means and movable therewith; and

motor means, including

first motor means for rotating the first plate means,

second motor means for pivoting the second plate means,

third motor means for moving the inner housing means relative to the outer housing means by rotating the rotating shaft means,

fourth motor means for rotating the third plate means within the inner housing means and relative to the outer housing means; and

control means for controlling the motor means for moving and positioning the camera means.

4,577,828

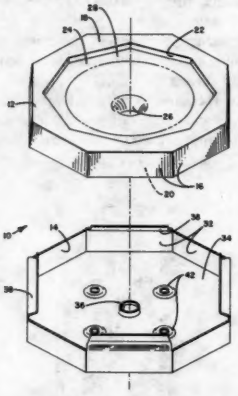
FAN COIL BASE PAD ASSEMBLY

Alan S. Drucker, Dewitt, and King H. Kwok, Liverpool, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Jun. 8, 1984, Ser. No. 618,656

Int. Cl.[4] F16M *5/00*

U.S. Cl. 248—678 **4 Claims**



1. A base pad assembly for supporting, during assembly, shipping, installation and operation, a fan coil unit of the type having a generally cylindrical heat exchanger enclosed in a polygon shaped cabinet, comprising:

a first member including a base portion, a top portion, side walls connecting said base portion with said top portion, a top surface recessed into said top portion and dimensionally generally coextensive in area with the area of the bottom of the polygon shaped cabinet, and an aperture axially extending therethrough for draining liquid from said top surface; and

a second member including a bottom portion, a side portion extending generally perpendicular from said bottom portion and defining a partial cover for said first member, and a plurality of integral projection means attached to and extending inwardly from said side portion for releasably securing said first member within said second member, wherein said second member bottom portion includes an aperture which is so located as to be in registration with said first member aperture.

4,577,829

SELF CLOSING VALVE

Reiner Strangfeld, Bückeburg, Fed. Rep. of Germany, assignor to Georg Rost und Soehne Armaturenfabrik GmbH und Co. KG., Porta Westfalica, Fed. Rep. of Germany

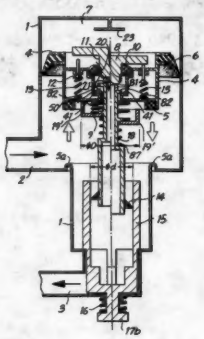
Filed Aug. 20, 1984, Ser. No. 642,300

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1983, 3330135

Int. Cl.[4] F16K *21/04*

U.S. Cl. 251—15 **2 Claims**

1. In a self closing valve having a housing including a water inlet and outlet and a valve piston mounted in the housing with one end of the piston facing away from a valve seat forming a discharge chamber in conjunction with the housing which communicates with the inlet and outlet through flowthrough passages, supplementary-valve control means for controlling the flow through the passages by effecting a decelerated opening stroke of the valve piston and a rapid closing stroke of the valve piston and including means for hydraulically maintaining an initiating position of the supplementary-valve control means during opening of the valve piston and shifting the supplementary-valve control means upon discontinuance of the maintenance including a choking device, the improvement comprising supplementary-valve means for any leakage flows that directly occur at the hydraulically maintaining means to the outlet without being choked off, wherein the supplementary-valve means is opened in response to the initiating position of the supplementary-valve control means and is closed in response to a shift in the supplementary-valve control means when maintenance is discontinued, thereby eliminating any bypass flow parallel to flow through the choking device.



4,577,830

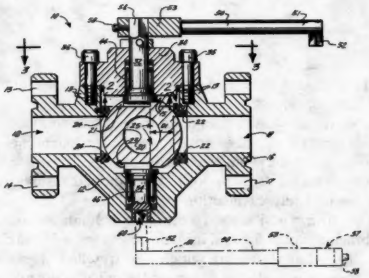
HIGH PRESSURE BALL VALVE WITH AN INTERFERENCE FIT CLOSURE SEAL

Mitchel E. Winegeart, 4512 Hessmer Ave., Metairie, La. 70002

Filed Aug. 27, 1985, Ser. No. 770,621

Int. Cl.[4] F16K *25/00*

U.S. Cl. 251—84 **18 Claims**



1. A valve comprising:

a. a valve housing having inlet and outlet portions connected by a flow bore with a straight linear central axis;

b. a ball valving member having a flow opening and being mounted for rotation within the valve body between open and closed flow position;

c. a pair of transverse slots formed on generally opposite surfaces of the ball valving member, above and below the flow opening respectively;

d. a removable valve bonnet forming a portion of the valve housing;

e. a first valve stem rotatably mounted in the housing generally opposite the removable valve bonnet and upon an axis of rotation that is transverse with respect to the flow bore axis, and including an end portion that engages one of the slots of the ball so that the first valve stem rotates and the ball are connected together for rotation;

f. a second valve stem rotatably mounted in the removable valve bonnet and upon an axis of rotation that is transverse with respect to the flow bore axis and including an end portion that engages one of the slots of the ball so that the stem and the ball are connected together for rotation;

g. a valve seat on the valve body for forming a closure to the flow bore with the ball valving member; and

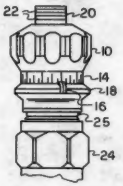
h. cam means, responsive to rotating at least one of the stems and the connected ball valving member to the closed position, for producing an interference fit between the ball valving member and the valve body at the seat, wherein load is transferred between the valve body including the bonnet and seat through both of the stems.

4,577,831

CALIBRATED HANDKNOB ASSEMBLY

Ernest A. DiBartolo, Sarasota, Fla., assignor to Sun Hydraulics Corporation, Sarasota, Fla.

Filed Apr. 1, 1985, Ser. No. 718,784
Int. Cl.[4] F16K *35/06*
U.S. Cl. 251—93 **16 Claims**



14. A calibrated handknob assembly for use with a valve having a fixed body with a groove and an outer serrate edge thereon and a control stem moveable in said fixed valve body comprising:

a stem secured to said control stem and having axially spaced circumferential graduations along one end;

a handknob having an axial passage therethrough for said stem, a plurality of circumferentially spaced graduations thereon, an outer serrate edge and a plurality of axially extending fingers terminating in inwardly extending lugs;

a lock ring having first and second inner serrate edges and first, second and third axial positions;

in said first axial position said first lock ring serrate edge and said valve serrate edge are engaged, said second lock ring serrate edge and said handknob serrate edge are engaged, said lugs are positioned in said valve groove and said handknob fingers are restricted from radial movement, whereby said handknob is prevented from turning and from being removed from said stem;

in said second axial position said first lock ring serrate edge and said valve serrate edge are engaged, said second lock ring serrate edge and said handknob serrate edge are disengaged, said lugs are positioned in said valve groove and said handknob fingers are restricted from radial movement, whereby turning said handknob will change the valve opening and cause a corresponding change in the length of said stem extending through said handknob passage and said handknob is prevented from being removed from said stem; and

in said third axial position said first lock ring serrate edge and said valve serrate edge are disengaged, said second lock ring serrate edge and said handknob serrate edge are disengaged and said handknob fingers are free to move radially outwardly, whereby the circumferential position of said lock ring can be changed and said handknob may be removed and repositioned without causing the valve opening to change.

4,577,832

ROTARY DRIVING APPARATUS

Ichita Sogabe, Gifu, Japan, assignor to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Feb. 21, 1985, Ser. No. 704,031
Claims priority, application Japan, Feb. 24, 1984, 59-34879
Int. Cl.[4] F16K *31/02*
U.S. Cl. 251—129.11 **11 Claims**

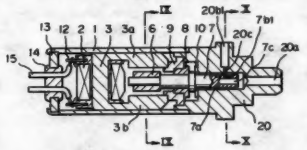
1. A rotary drive apparatus comprising:

an axially elongated casing having a circular cross-sectional shape;

a rotor rotatably arranged in said casing about an axis of the casing, said rotor being a permanent magnet;

a first stator fixedly arranged in the casing and made of magnetic material, said stator having a connection portion and a pair of circumferentially spaced pole portions extending from the connection portion, each pole portion defining a pair of spaced side surfaces extending substantially radially and inner and outer circumferential surfaces connecting said side surfaces, said outer circumferential surface forming, in cross section, an arc shape corresponding to the inner periphery of the casing, allowing the outer circumferential surface to be located closely adjacent to the inner surface of the circular cross-sectional shape casing;

said rotor having a pair of radially spaced and oppositely magnetized pole portions, each of which defines a pair of spaced side surfaces extending substantially radially outward of the inner surfaces of the pole portions of the



stator, allowing rotation of the rotor to a limited angle between a position where at least one pair of opposing side surfaces of the stator pole portions and the rotor pole portions are engaged with each other and another position where at least another one pair of the opposing surfaces of the stator pole portions and the rotor pole portions are engaged with each other;

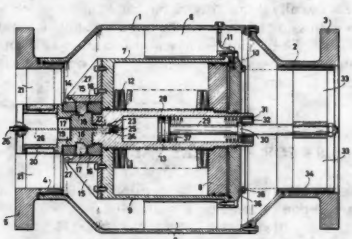
coil means, arranged on one side of the rotor along the axis of the casing, for magnetizing said first stator so that the pole portions of the stator are oppositely magnetized, whereby a closed loop of magnetic flux, the direction of which is determined in accordance with the direction of an electric current in the coil means, is generated in order to attain the rotational movement of the rotor in a desired direction between said positions.

4,577,833

HOSE FITTING WITH AUTOMATIC SEPARATION UNDER STRONG TENSILE STRESS

Giorgio Bormioli, via Galileo Galilei,, 11-35100 Padova, Italy

Filed Mar. 12, 1984, Ser. No. 588,450
Claims priority, application Italy, Apr. 20, 1983, 20686 A/83
Int. Cl.[4] F16L *29/00*
U.S. Cl. 251—149.1 **8 Claims**



1. A hose fitting comprising a fluid product conveying tubular casing having a fixed inlet portion attachable to a first hose and an axially removable outlet portion attachable to a second hose, a fixed cylinder coaxially connected to said inlet portion,

a piston slidingly housed in said fixed cylinder, thrust means acting on said piston normally to urge it towards said inlet portion with a force greater than that exerted on said outlet portion by the fluid product fed to said outlet portion from said inlet portion, an axially movable cylinder coaxially housed in said fixed cylinder and integral with said piston, means for releasably connecting together said movable cylinder and said outlet portion, and operative in response to axial stresses between said inlet and outlet portions initially to cause movement of said outlet portion, said movable cylinder and said piston in unison with respect to said inlet portion and against the resistance of said thrust means, and then, if said stresses are greater than a predetermined value, to cause said connecting means operatively to release said outlet portion from said movable cylinder and thereby from said inlet portion, said fixed cylinder being coaxially housed inside said tubular casing.

4,577,834

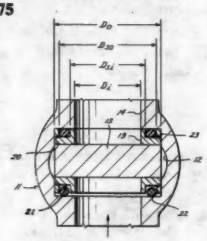
DOWNSTREAM SEALING DEVICE

John P. Oliver, 37 Stillforest, Houston, Tex. 77024

Continuation-in-part of Ser. No. 300,215, Sep. 8, 1981, abandoned. This application Feb. 25, 1985, Ser. No. 704,915

Int. Cl.[4] F16K *3/20*

U.S. Cl. 251—175 **8 Claims**



1. A downstream sealing valve, comprising a body having a flowway therethrough and a cavity therein intersecting the flowway, a closure member received within the cavity for movement between the flowway opening and closing positions, and a pair of seats carried within the body each having an inner end with a bearing surface facing one side of the gate and an outer end with a bearing surface facing an annular surface of the body, the outer bearing surface of each seat having an annular groove therein, having radially inner and outer side walls which extend inwardly from the outer bearing surface and a bottom wall extending between the side walls, a seal member carried within each groove and being thicker than the depth of the groove so as to protrude from the outer bearing surface when unstressed, said closure member and seats being free to float in the direction of the flowway, so that, when the closure member is in flowway closing position, one side of the closure member will be urged by upstream line pressure against the downstream seat, each seat having means fluidly connecting the groove near its bottom wall with the exterior of the seat radially outwardly of the engagement of the seal member within said groove with the opposite annular surface of the body, and the bearing surfaces on the inner ends of the seats having metal-to-metal engagement with opposite sides of the closure member.

4,577,835

INSERT FOR A FAUCET VALVE FOR INCREASING FLOW RATE

Frank R. Holycross, Jr., Batesville, Ind., assignor to Masco Corporation of Indiana, Taylor, Mich.

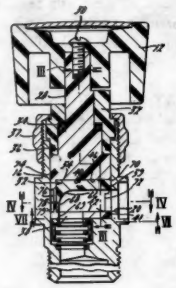
Filed May 17, 1984, Ser. No. 611,146

Int. Cl.[4] F16K *5/04*

U.S. Cl. 251—310 **6 Claims**

5. In a faucet body having a cylindrical bore therein; an inlet port opening into and offset from the axis of said bore and an outlet port; a valve assembly rotatable in said bore and having an inlet offset from the axis of rotation and a cavity passage extending laterally from said inlet; the improvement in the valve assembly characterized by:

an insert member having contoured walls forming a notch within said insert member, said contoured walls in con-



junction with a wall of said cavity passage forming a passage of reduced cross-sectional area substantially equal to the area of said inlet port at one end of said cavity passage and said outlet port at another end of said cavity passage.

4,577,836

FLAP FOR A HEATER OR AIR CONDITIONER INSTALLATION FOR A MOTOR VEHICLE CABIN

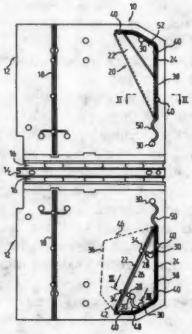
Jean Guillemin, Elancourt, France, assignor to VALEO, Paris, France

Filed Jun. 14, 1984, Ser. No. 620,739

Claims priority, application France, Jun. 14, 1983, 83 09834

Int. Cl.[4] F16K *51/00*

U.S. Cl. 251—356 **11 Claims**



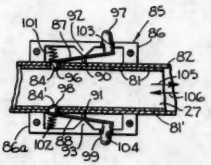
1. In a flap for an air flow installation, in particular for the cabin of a motor vehicle, said flap comprising a support plate and at least one air-guiding blade mounted on said plate; the improvement wherein said blade comprises at least two thin walls of substantially rigid plastics material molded to said support plate and projecting laterally therefrom in generally spaced relation to each other, at least one of said walls being folded toward and fixed to the other wall outward of said support plate to define a blade on said plate having a volume which is greater than the sum of the volumes of said thin walls.

4,577,837

LOCKING MECHANISM FOR EXTENDIBLE TELESCOPING TUBULAR MEMBERS

Marvin Berg, 1785 Lois Dr., and Bruce Grachek, 1800 Hillview Rd., both of New Brighton, Minn. 55112

Filed Jul. 30, 1984, Ser. No. 635,574
Int. Cl.[4] A47G *27/04*; F16B *7/10*; F16D *1/00*
U.S. Cl. 254—212 6 Claims



2. A locking mechanism for inner and outer telescoping tubular members formed with axially aligned, radial openings, said locking mechanism comprising:

(a) a hollow housing surrounding the outer tubular member;

(b) a lever mounted for pivotal movement within said housing;

(c) oppositely directed locking plunger and lever actuating plunger mounted at opposite end sections of said lever, said locking plunger projecting out of said housing and entering registering openings in said inner and outer telescoping tubular members for restraining relative axial displacement between said inner and outer telescoping tubular members, said actuating plunger projecting out of said housing and actuated to remove said locking plunger from registering openings in said inner and outer tubular members for relative axial displacement between said inner and outer telescoping tubular members;

(d) a spring disposed within said housing and connected to said lever for urging said locking plunger to remain in entered registering openings, the actuation of said actuating plunger to remove said locking plunger from registering openings being against the urgency of said spring; and

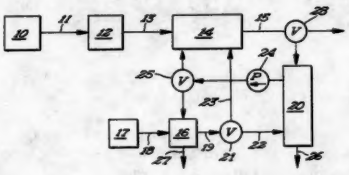
(e) a fulcrum member fixedly positioned in said housing and a fixedly positioned block in said housing having an apex confronting said fulcrum member, said lever being disposed between said block and said fulcrum member intermediate the end portions of said lever.

4,577,838

TREATMENT OF PELLETIZED IRON ORES

Mait M. Mathiesen, Arild, Sweden, assignor to Plasma Holdings, N.V., Minneapolis, Minn.

Continuation of Ser. No. 458,565, Jan. 17, 1983, abandoned. This application Jun. 18, 1984, Ser. No. 621,882
Int. Cl.[4] C22B *4/08*
U.S. Cl. 266—171 4 Claims



1. Material processing apparatus for the production of pelletized iron ore concentrates of the type wherein the material is introduced for processing as ore fines, is pelletized and is fired in an indurator to produce feedstock for reduction by remote reducing means, the improvement which comprises:

low temperature plasma means;

on-site reduction plant means;

means for selectively diverting a portion of said material in process as fired, pelletized ore concentrates from the output of the indurator including a first valving mechanism to divert the ore concentrates to said on-site reduction plant means;

means suppling solid fuel to said low temperature plasma means for gasification thereby; and

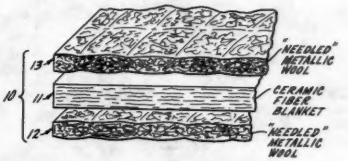
a second valving mechanism for selectively directing effluent from the plasma means to the on-site reduction plant means and to the indurator and for further selectively diverting effluent as needed from the on-site reduction plant means to the indurator.

4,577,839

REFRACTORY INSULATOR BLANKET AND COVER

Robert A. Carlson, Northbrook, Ill., and Nicholas H. Smith, Chesterton, Ind., assignors to Reptech, Inc., Nortfield, Ill.

Filed Jan. 9, 1984, Ser. No. 569,032
Int. Cl.[4] C21C *5/48*
U.S. Cl. 266—272 48 Claims



1. A light weight, flexible, composite insulator blanket capable of extended, repetitive use as a cover or insulator wrapping or gasket for a very high temperature heat source comprising a vessel or conduit employed in transporting, processing, or storing molten or near-molten metal, at temperatures in excess of 1600° F., the insulator blanket comprising:

a principal insulator layer of a light weight, flexible, fibrous ceramic material, subject to deterioration through devitrification and abrasion when subjected to prolonged exposure to a very high temperature heat source;

a protective layer of light weight, flexible fibrous metallic material, covering one surface of the principal insulator layer to a depth many times greater than the thickness of the metallic fibers; and

fastening means securing the protective layer to the principal insulator layer at a multiplicity of locations throughout the surface area of the insulator blanket.

4,577,840

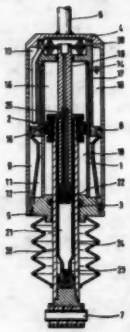
SELF-PUMPING HYDROPNEUMATIC SPRING LEG OR STRUT WITH INTERNAL LEVEL CONTROL FOR MOTOR VEHICLES

Theo Meller; Heinz Knecht, both of Eitorf, and Werner Kuchheuser, Windeck, all of Fed. Rep. of Germany, assignors to Boge GmbH, Eitorf, Fed. Rep. of Germany

Filed Feb. 24, 1984, Ser. No. 583,187
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1983, 3306393
Int. Cl.[4] B60G *17/04*; F16F *9/18*
U.S. Cl. 267—64.17 14 Claims

1. In a self-pumping hydropneumatic telescopic spring leg with internal level control, particularly for motor vehicles, comprising an oil-filled working cylinder, gas cushion means for subjecting said oil-filled working cylinder to gas cushion pressure, a working piston displaceable in the working cylinder for transmitting forces, a hollow space in a piston rod connected with said piston, the hollow space in the piston rod forming a pump cylinder, a pump rod secured to the working cylinder and extending into said pump cylinder, said working

piston dividing said working cylinder into two working chambers, means forming a low pressure oil chamber, a bore formed in said pump rod and communicating at one end with said low pressure oil chamber, a suction valve carried by said pump rod at the other end for controlling said bore, discharge valve means communicating with said pump cylinder for passing pumped oil from said pump cylinder into one of said working chambers subjected to said gas cushion pressure, whereby relative reciprocation of said pump rod and pump cylinder pumps oil from said low pressure oil chamber to said one working chamber to increase the pressure in said working cylinder, and control means responsive to a predetermined working position of said working piston in said working cylinder for connecting said one working chamber with said low



pressure chamber, said control means comprising a control opening in said pump rod extending between said working cylinder and said bore in the pump rod, control edge means movable with said working piston for closing said control opening and for opening said control opening when said working piston is in said predetermined working position, wherein the improvement comprises a sleeve in said pump rod for preventing said control opening from having direct access to said pump rod bore and said low pressure chamber, and for routing oil flow from said control opening indirectly via a connecting duct and throttle means to said pump rod bore when said control opening is in the open state so as to retard pressure reduction in said one working chamber upon opening of said control opening.

4,577,841

BENT WIRE SPRING UNIT

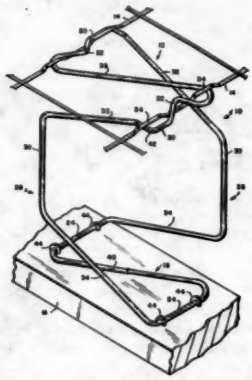
Robert C. Hagemeister, Boston, Mass., assignor to Webster Spring Co. Inc., Oxford, Mass.

Filed Jul. 18, 1984, Ser. No. 631,991

Int. Cl.[4] A47C *23/02*

U.S. Cl. 267—103 **7 Claims**

1. A bent wire spring unit comprising first spaced, parallel attaching elements adapted to be attached at longitudinally and transversely-spaced intervals to pairs of spaced, parallel grid wires of the grid frame and the support members of a base frame of a spring assembly comprising a base frame and a grid frame wherein the grid frame comprises a border wire and crossing grid wires attached at their ends to the border wire and the base frame comprises rectangularly-arranged, spaced, parallel end and side members and longitudinally-spaced, parallel support members fixed at their opposite ends to the side members, and spaced, parallel, C-shaped lengths of wire disposed between the attaching elements and connected thereto, said C-shaped lengths of wire being disposed in planes perpendicular to the planes of the attaching elements and at a spacing corresponding to the length of the attaching elements and each comprising a first length of wire connected at one end to one end of the top attaching element and inclined downwardly from said one end, said first lengths of wire being inclined downwardly in opposite directions, second lengths of wire connected at one end to one end of the bottom attaching element and inclined upwardly, said second lengths of wire being inclined in opposite directions, third lengths of wire perpendic-



ular to the top and bottom lengths of wire connected at their upper and lower ends with the inclined lengths of wire and diagonal lengths of wire situated in the planes of the top and bottom attaching elements connected at their opposite ends to the other ends of the top and bottom attaching elements.

4,577,842

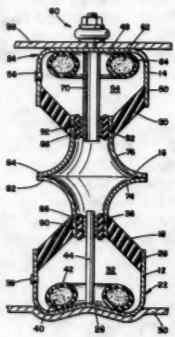
SELF-STABILIZING DRY VISCOUS SPRING DAMPER

Emile M. Shtarkman, Cleveland, Ohio, assignor to Imperial Clevite Inc., Glenview, Ill.

Continuation-in-part of Ser. No. 554,906, Nov. 25, 1983, Pat. No. 4,555,098. This application May 17, 1984, Ser. No. 611,489

Int. Cl.[4] F16F *5/00*

U.S. Cl. 267—140.1 **7 Claims**



1. A viscous spring damper for damping and leveling structural agitation which is resistant to nonaxial deformation comprising:

a first outer housing and a second outer housing;

an elastomeric shear spring associating said first outer housing with said second outer housing;

a selectively pressurizable gas chamber and a subchamber within said gas chamber contained within at least one of said first and second housing and constant pressure means in fluid communication with selectively pressurizable gas chamber; and

a rigid structural member in which one end is mounted in

one of said housings and said other end is received in a bearing which is mounted to the other housing by an elastomeric bushing whereby said bushing and said structural member allow and control nonaxial deformation within said damper.

4,577,843

VEHICLE DOOR SUPPORT

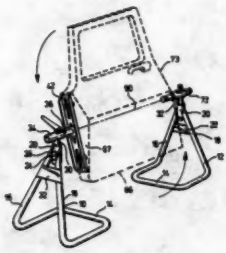
Donald R. Milwain, General Delivery, Hwy. 48, Baldwin, Ontario, Canada L0E 1A0

Filed Sep. 17, 1984, Ser. No. 651,142

Claims priority, application Canada, Feb. 27, 1984, 449581

Int. Cl.⁴ B23Q *1/04*

U.S. Cl. 269—51 **6 Claims**



1. An apparatus for supporting a vehicle door having threaded holes on one edge for receiving bolts and a closable recess formed by the door locking mechanism on the opposite edge, said apparatus comprising, in combination:

first and second spaced-apart stands, said first stand having an elongated connector adapted to be secured to one edge of the door by bolts threaded into the holes, axle means for securing said connector to said stand for pivoting about a horizontal axis, and means for locking said securing means to prevent pivoting of the connector;

said second stand having a horizontal spindle secured to said stand adapted to be received in the closable recess of the door for rotation of the door about the spindle;

means for adjusting the height of the elongated connector and the spindle for substantial coaxial alignment of the connector axle means relative to the spindle about on axis passing through the door whereby the vehicle door can be pivoted and locked at a desired position about said axis, said elongated connector having a longitudinal slot formed at each end for receiving the bolts threaded into the door holes and a central longitudinal slot for receiving connecting means for securement of the axle means substantially perpendicular to the elongated connector.

4,577,844

VERTICALLY ADJUSTABLE DEVICE

Wolfgang Schlegel, Oehringen; Arthur Wilke, Bad Friedrichshall-Jagstfeld, and Roland Stein, Oehringen-Verrenberg, all of Fed. Rep. of Germany, assignors to Schlegel GmbH, Oehringen, Fed. Rep. of Germany

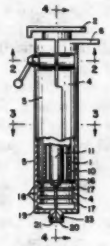
Continuation of Ser. No. 540,326, Oct. 11, 1983, abandoned. This application Feb. 11, 1985, Ser. No. 700,398

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1982, 3242832

Int. Cl.⁴ B23Q *1/04*

U.S. Cl. 269—71 **17 Claims**

17. A vertically adjustable device for vises and assembly platforms, comprising a vertical support tube for supporting said vise, a mounting for attaching said support tube to a work bench, said mounting comprising two semicylindrical clamping shells embracing said support tube, one of said shells being stationary and having connected to it a supporting extension for attachment to said work bench, the other shell being movable with respect to the stationary shell, means for clamping said clamping shells together directly against the support tube to fix said support tube in any desired vertical position, said shells extending downwardly from said supporting extension beyond a lower end of the support tube lower and defining a cavity closed beyond the end of the support tube, each shell having at its end beyond the support tube an axially extending



projection, a spring ring member which embraces the closed ends of the shells, said shells being formed with a circumferential groove in the outer surfaces of the axially extending projections for receiving the spring ring, and spring means positioned within said cavity and extending into said support tube, said spring means having one end in abutting relation with said support tube and the other end in abutting relation with said shells beyond the end of said support tube.

4,577,845

HYDROSTATIC PRESSURE XY TABLE

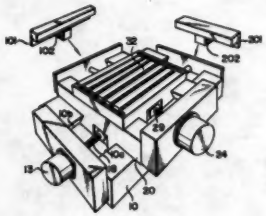
Sosaku Kimura, and Toshikazu Hatsuse, both of Saitama, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Jan. 9, 1984, Ser. No. 569,217

Claims priority, application Japan, Jan. 18, 1983, 58-5279; Mar. 8, 1983, 58-36667

Int. Cl.⁴ B23Q *1/18*

U.S. Cl. 269—73 **5 Claims**



1. In an XY table comprising a bed, a first lead screw supported on the bed by bearings, a first motor provided on the bed for rotatingly driving the first lead screw, a first sliding table mounted on the bed for sliding motion in the X direction, the first sliding table having a first nut for engagement with the first lead screw, a second lead screw supported on the first sliding table by bearings, a second motor provided on the first sliding table for rotatingly driving the second lead screw, and a second sliding table mounted on the first sliding table for sliding motion in the Y direction, the second sliding table having a second nut for engagement with the second lead screw, the improved hydrostatic pressure XY table characterized in that the bed has a first trapezoidal groove; the first sliding table is engaged with the first trapezoidal groove and has a second trapezoidal groove running perpendicular to the first trapezoidal groove; the second sliding table is engaged

with the second trapezoidal groove; four hydrostatic pressure guides are provided in the bed, one on either inclinded lateral wall of the first trapezoidal groove and one on either side of the first trapezoidal groove on the upper surface of the bed, to engage with engaging surfaces of the first sliding table; four hydrostatic pressure guides are provided in the first sliding table, one on either inclined lateral wall of the second trapezoidal groove and one on either side of the second trapezoidal groove on the upper surface of the first sliding table, to engage with engaging surfaces of the second sliding table; a plurality of fluid pressure lines are provided for supplying hydrostatic pressure from an external hydrostatic fluid pressure source to the engaging surfaces of the first and second sliding tables, each of the fluid pressure lines for supplying hydrostatic fluid pressure from an external hydrostatic fluid pressure source to engaging surfaces of the first and second sliding tables comprises a pantograph fluid pressure line consisting of a first rotatable member on whichever of the base and the first sliding table constitutes the stationary side and connected with the external hydrostatic fluid pressure source, a second rotatable member fixed on whichever of the first sliding table and the second sliding table constitute the moving side, and a rotatable coupling provided with a fluid passage for connecting the first member with the second member, the pantographic fluid pressure line being disposed within the area of the bed as viewed from the top and within the space between the bed and first sliding table or between the first sliding table and the second sliding table; a first hydrostatic pressure feed mechanism consisting of the first lead screw, the first nut and a fluid pressure line for supplying hydrostatic pressure through the first nut to opposite screw faces of the first lead screw is provided for the first sliding table; and a second hydrostatic pressure feed mechanism consisting of the second lead screw, the second nut and a fluid pressure line for supplying hydrostatic pressure through the second nut to opposite screw faces of the second lead screw is provided for the second sliding table.

4,577,846

DEVICE FOR MOUNTING AN OBJECT

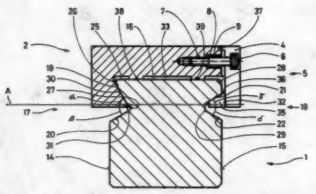
René Büchler, Weidweg 2, CH-9245 Sonnental, Switzerland

Filed Jan. 18, 1984, Ser. No. 571,754

Claims priority, application United Kingdom, Jan. 18, 1983, 8301296

Int. Cl.[4] B23Q *1/04*

U.S. Cl. 269—82 23 Claims



1. A device for mounting an object in a desired position in space, with a guiding piece and with a guided piece on which the object may be attached, wherein marginal parts of two opposite lateral faces of the guiding piece, which adjoin a surface of the guiding piece common to them, are provided with channels to form a profile, the flanks of these channels forming an angle other than 0° with the median plane A of the channels, the guided piece exhibits a recess with a bottom to receive the profiled part of the guiding piece and one of two lateral walls of said recess is undercut so that it can be brought into engagement with the first of the channels in the guiding piece; and wherein the other lateral wall is oriented approximately at right angles to the bottom of said recess and is provided with a holding device which can be in engagement with the second channel, located therebeneath, of the guiding piece.

4,577,847

CLAMPING DEVICE

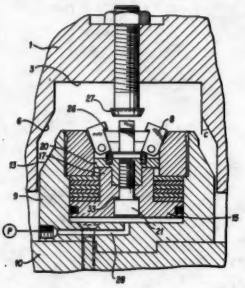
Sven-Erik Schedwin, Box 8280, Falun, Sweden

Filed Apr. 11, 1984, Ser. No. 599,183

Claims priority, application Sweden, Apr. 12, 1983, 8302028

Int. Cl.[4] B23Q *3/02*

U.S. Cl. 269—309 6 Claims



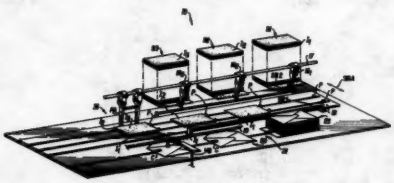
1. In a clamping device for clamping such apparatus as worktables and fixtures on a base, such as on the machine table of a machine tool, said clamping device including a holding means (2) having an enlarged head (4) and being secured to either of said apparatus or said base, and a housing (9) being secured to the other of said apparatus or said base, said housing (9) having a central opening (14), a clamping mechanism (7) received in said central opening (14) and carrying clamping means (8) comprising clamping hooks pivotal between a clamping position for engaging head (4) of said holding means (2) and a disengagement position for completely disengaging said head of said holding means, the improvement comprising clamping means (7) for clamping and unclamping said clamping hooks so that in a normal condition said clamping means acts with its full clamping force against said clamping hooks and in a disengaging condition said clamping means unloads said clamping hooks when a disengagement force is applied thereto, said clamping means (7) comprising a mechanical clamping force means (18) for acting between a collar (19) positioned at the inner wall of housing (9) and a piston (15) sealingly engaging said inner wall of housing (9) and having a piston rod (17) having an end extending from a first side of said piston and facing said holding means (2), said end carrying the clamping hooks (8); said piston (15) being constantly acted upon by said clamping force means (18) for urging piston 15 and thereby piston rod (17) and said clamping hooks in a direction away from holding means (2) but being urged in the opposite direction when said disengagement force, counteracting and exceeding said clamping force, is applied to a second side of piston (15) opposite said first side to which said piston rod is connected; and, said clamping hooks (8) being slidable in central opening (14) of housing (9) and engaging a guide surface (24) provided on said inner wall of housing (9) for swinging movement of said clamping hooks towards the clamping position during movement of said clamping hooks in the clamping direction and for preventing movement from the clamping position during clamping.

4,577,848

METHOD AND APPARATUS FOR CONTROLLING THE ACTUATION OF GRIPPER ARMS

Kenneth A. Hams, Easton, Pa., assignor to Bell & Howell Company, Allentown, Pa.

Continuation of Ser. No. 648,407, Sep. 7, 1984, abandoned. This application Jul. 11, 1985, Ser. No. 754,204
Int. Cl.[4] B65H *5/30*
U.S. Cl. 270—55 13 Claims



1. An insertion machine comprising:

a plurality of insert stations whereat supplies of insert material are at least temporarily stored;

an insert track which is indexed along said plurality of insert stations for the transport of inserts deposited thereon;

gripper arm means associated with a plurality of insert stations, said gripper arm means each comprising:

a first jaw member;

a second jaw member, said second jaw member being selectively movable with respect to said first jaw member for the engagement of insert material therebetween; and,

means for selectively actuating said first and second jaw members to a first position whereby insert material is engageable between said jaws and to a second position whereby insert material is released from between said jaws and deposited on said insert track;

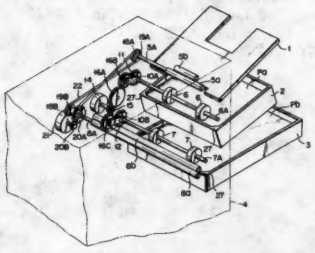
means for controlling said plurality of actuating means whereby the actuation of each of said gripper arms for the release of insert material is delayable, said control means including master presettable delay means whereby for said plurality of gripper arms said delay has a uniform release delay component which is related to a predetermined input value.

4,577,849

MULTIPLE SOURCE PAPER CONVEYOR SYSTEM

Junji Watanabe, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 16, 1983, Ser. No. 494,888
Claims priority, application Japan, May 31, 1982, 57-91173
Int. Cl.[4] B65H *3/06, 3/44*
U.S. Cl. 271—9 12 Claims



1. A paper conveyor system comprising:

first feeding means disposed rotatably and rotating in a direction for feeding paper along a first path of travel;

second feeding means disposed rotatably and rotating in a direction for feeding paper along a second path of travel;

first clutch means attached to the first feeding means, for transmitting rotation in said first paper feeding direction to the first feeding means, and for preventing rotation in the other direction opposite to said first paper feeding direction from being transmitted to the first feeding means;

second clutch means attached to the second feeding means, for transmitting rotation in said second paper feeding direction to the second feeding means, and for preventing rotation in the other direction opposite to said second paper feeding direction from being transmitted to the second feeding means;

a first reversible motor capable of selectively rotating in either direction;

first transmission means arranged between the first reversible motor and the first clutch means to transmit the rotation of the first reversible motor to the first clutch means so that the first clutch means rotates in the same direction as the rotating direction of the first reversible motor; and

second transmission means arranged between the first reversible motor and the second clutch means to transmit the rotation of the first reversible motor to the second clutch means so that the second clutch means rotates in the opposite direction to the rotating direction of the first reversible motor;

third feeding means disposed rotatably and rotating in a direction for feeding paper along a third path of travel;

fourth feeding means disposed rotatably on the downstream side of the third path of travel and rotating in a direction for feeding along a fourth path of travel paper received from said first, second and third feeding means;

third clutch means attached to the third feeding means, for transmitting rotation in said third paper feeding direction to the third feeding means, and for preventing rotation in the other direction opposite to said third paper feeding direction from being transmitted to the third feeding means;

fourth clutch means attached to the fourth feeding means, for transmitting rotation in said paper feeding direction to the fourth feeding means, and for preventing rotation in the other direction opposite to said paper feeding direction from being transmitted to the fourth feeding means;

a second reversible motor capable of selectively rotating in either direction;

third transmission means arranged between the second reversible motor and the third clutch means to transmit the rotation of the second reversible motor to the third clutch means so that the third clutch means rotates in the same direction as the rotating direction of the second reversible motor; and

fourth transmission means arranged between the second reversible motor and the fourth clutch means to transmit the rotation of the second reversible motor to the fourth clutch means so that the fourth clutch means rotates in the opposite direction to the rotating direction of the second reversible motor.

4,577,850

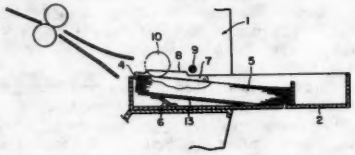
AUTOMATIC PAPER FEEDER FOR REPRODUCING MACHINE

Kokichi Takeyama; Kiyoshi Sugawara, and Yasuyuki Fukagawa, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 317,734, Nov. 3, 1981, abandoned. This application May 21, 1984, Ser. No. 613,009
Int. Cl.[4] B65H *3/30*
U.S. Cl. 271—22 5 Claims

1. In an automatic paper feeder or a reproducing machine, of the type comprising a cassette insertable into a paper feeding

station, said paper feeding station including a roller for feeding paper from said cassette into said reproducing machine and said cassette including means for supporting said paper, the improvement comprising:



separating means for automatically providing a clearance between said roller and said paper during insertion of said cassette into said paper feeding station by automatically urging said paper away from said roller in response to movement of said cassette into said station.

4,577,851

DEVICE FOR SINGLING OUT STACKED SHEETS

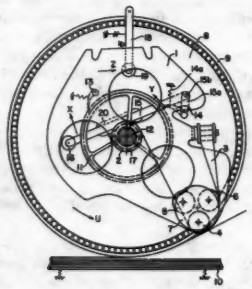
Wilhelm Müller, Frankfurt, Fed. Rep. of Germany, assignor to Postalia GmbH, Berlin, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 367,895, Apr. 13, 1982, abandoned. This application Apr. 16, 1985, Ser. No. 723,977

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1981, 3115989

Int. Cl.[4] B65H *3/20*

U.S. Cl. 271—33 **5 Claims**



1. Device for individually separating sheets from a stack thereof by means of a band-shaped adhesive carrier extending from a supply roller over guide rollers to a wind-up roller, action of the adhesive carrier being adaptable to characteristics of the sheet surface by selection of various guide-roller profiles, comprising an adhesive head and a drum mounted on a disk so as to afford both angular displacement as well as rotation of said adhesive head, said disk forming an inner bearing ring of said drum for feeding the sheets, said adhesive head having a side mounting plate, one of the guide rollers projecting in use beyond said side mounting plate of said adhesive head and beyond said drum at a location of adhesion between said adhesive carrier and a sheet to be individually separated from a stack thereof.

4,577,852

APPARATUS FOR COUNTING THE SHEETS IN A STREAM OF PARTLY OVERLAPPING SHEETS

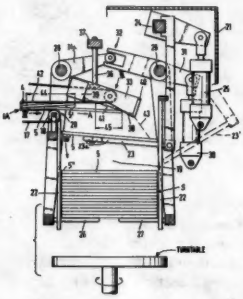
Roland Grunder, Vordemwald, Switzerland, assignor to Grapha-Holding AG, Hergiswil, Switzerland

Division of Ser. No. 402,891, Jul. 29, 1982, abandoned. This application Sep. 10, 1984, Ser. No. 648,899

Claims priority, application Switzerland, Aug. 11, 1981, 5151/81

Int. Cl.[4] B65H *29/34*

U.S. Cl. 271—188 **4 Claims**



1. Apparatus for manipulating sheets in a stream of successive partially overlapping sheets, comprising a sheet receiving duct; means for transporting successive sheets of the stream in a predetermined direction to a position above said duct; a plurality of sheet intercepting and stacking means disposed at different levels of said duct; means for moving said intercepting and stacking means into and for withdrawing such intercepting and stacking means from said duct at the respective levels so as to effect a cascading of sheets from each upper level to the respective lower level; means for receiving stacks of sheets from said duct upon withdrawal of the intercepting and stacking means form the lowermost one of said levels; guide means for deflecting downwardly and into said duct successive sheets which are supplied by said transporting means to said position above said duct, said transporting means defining a first path extending to said guide means and said guide means defining for the sheets a second path which is inclined with reference to said first path; and means for counting the thus deflected successive sheets, comprising an opto-electronic counter including a radiation source arranged to direct a beam of radiation across the course of advancement of the leaders of successive sheets along said second path.

4,577,853

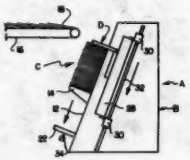
STACKING APPARATUS

B. Michael Duke, Plattsburgh, N.Y., assignor to Harris Graphics Corporation, Melbourne, Fla.

Filed Jan. 16, 1984, Ser. No. 570,923

Int. Cl.[4] B65H *31/10*

U.S. Cl. 271—217 **16 Claims**



1. Apparatus comprising stacking means for stacking sheet-

like articles into a stack and moving such stack to a stack transfer position during which an edge of the articles in the stack drags along a guide surface and causes separation of articles from the stack at the trailing end thereof, follower means for engaging the trailing end of the stack and preventing separation of articles therefrom during movement of the stack to the stack transfer position, means for moving said follower means into engagement with the trailing end of the stack after the stack has been formed and for moving said follower means in one direction with the stack to the stack transfer position and in an opposite direction to a ready position for cooperation with a new stack being formed, and means for continuously maintaining said follower means in a stack engaging position while said follower means moves in the one direction and for shifting said follower means to a stack-clearing position while said follower means moves in the opposite direction.

4,577,854

METHOD AND APPARATUS FOR THE POSITIONING OF TEXTILE SURFACE CONFIGURATIONS

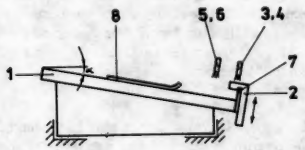
Bernd Bachmann, Altenburg; Peter Kuss, Dittsmannsdorf; Frank Schuhmann, Altenburg, and Jürgen Wöllner, Nobitz, all of German Democratic Rep., assignors to VEB Kombinat Textima, Karl-Marx-Stadt, German Democratic Rep.

Filed Feb. 16, 1983, Ser. No. 467,058

Claims priority, application German Democratic Rep., Mar. 22, 1982, 238342

Int. Cl.[4] B65H 7/02

U.S. Cl. 271—227 6 Claims



1. An apparatus for positioning thin materials in two directions, comprising:

a positioning table having a contact edge along one side thereof,

at least two air nozzles situated in the positioning table equidistantly away from the contact edge, said air nozzles being oriented toward the contact edge so that air is blown toward the contact edge,

at least two first sensors situated adjacent to the contact edge and operationally connected to the air nozzles so that when one of the first sensors senses that the material is situated adjacent the contact edge, that sensor operates to actuate the nozzle located more remote from that sensor to cause air to flow therethrough to align the material along the contact edge,

a clamping device situated along the contact edge of the positioning table so that when the material is located in a proper position, the clamping device is operated to fixedly hold the material on the positioning table,

means for moving the positioning table parallel to the contact edge for a predetermined distance, and

at least one second sensor situated away from the positioning table in the direction of movement thereof, said second sensor sensing the position of the material on the positioning table to stop the positioning table after it has moved the predetermined distance.

4,577,855

APPARATUS AND METHOD FOR REMOVING AND CONVEYING AWAY A SAMPLE COPY FROM AN ORDERLY FLOW OF PRINTED PRODUCTS

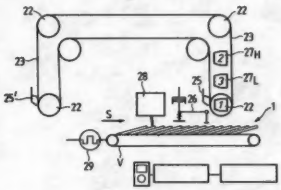
Walter Reist, Hinwil, Switzerland, assignor to Feramatic AG, Hinwil, Switzerland

Filed Feb. 2, 1984, Ser. No. 576,472

Claims priority, application Switzerland, Feb. 2, 1983, 589/83

Int. Cl.[4] B65H 29/04

U.S. Cl. 271—281 20 Claims



1. An apparatus for removing and conveying away a sample copy from an orderly imbricated material flow of printed products, comprising:

a power driven conveyor for conveying an orderly imbricated flow of printed products;

a conveying chain mounted on guide pulleys, one of said pulleys located adjacent the material flow;

a first gripper coupled to said chain, said gripper having relatively movable first and second gripping members and an elongated, flexible cushioning spring extending from said first gripping member, said cushioning spring being bendable about an axis transverse to a longitudinal axis thereof and being movable between a ready position in which said cushioning spring is bent and pretensioned such that a free end of said cushioning spring is biased toward said conveyor and a guiding position in which said free end engages the material flow to guide the sample copy between said gripping members;

a cushioning spring clamp releasably coupled to said cushioning spring for maintaining said cushioning spring in said ready position; and

control means for regulating operation of said gripper and said clamp in response to detection of individual products and speed thereof.

4,577,856

THEATRICAL RISERS

Dale W. Blackaby, 913 S. 13th St., Pekin, Ill. 61554

Filed Aug. 17, 1983, Ser. No. 524,055

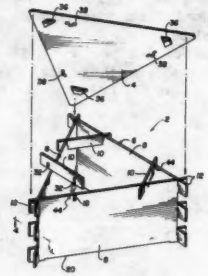
Int. Cl.[4] A63J 5/00

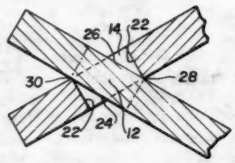
U.S. Cl. 272—25 20 Claims

1. A collapsible theatrical riser usable by choral groups, drama groups and the like, comprising, a base formed of a plurality of vertical panels, a horizontal top panel which is supported on said base; each of said vertical panels having an exterior surface, an interior surface, an upper edge, a lower edge and two vertical ends; said base having corners where said vertical panels are connected to each other,

each of said panels having hook and slot connection means formed in both of its ends, said hooks being similar to each

other but being directed upwardly at one end of the panel and downwardly at the other end of the panel, one hook





at each end of a panel having an upper edge which extends to and is aligned with the upper edge of the panel.

4,577,857

SIMPLIFIED APPARATUS FOR USE IN ARM WRESTLING OR WRIST PULLING CONTESTS

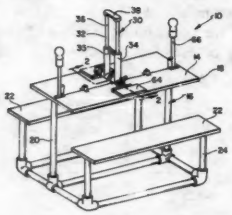
Exsior Dion, 547 River Rd., Lincoln, R.I. 02865

Filed Jun. 8, 1983, Ser. No. 502,224

The portion of the term of this patent subsequent to Jan. 24, 2001, has been disclaimed.

Int. Cl.[4] A63B *5/00, 67/00*

U.S. Cl. 272—67 **3 Claims**



1. Apparatus for conducting arm wrestling contest between a pair of opposed contestants comprising a generally planar contest surface having a pair of longitudinally separated posts positioned along the median line of said surface and having stop means mounted thereon, an elongated lever arm having upper and lower ends, said lever arm pivotally supported at its lower end proximate said contest surface and adapted to contact said stop means at opposite ends of its side-to-side arcuate travel movement within the limits defined by said stop means, said lever arm including a laterally extending generally tubular base portion positioned at opposite ends thereof in trunnions in turn supported by said surface, means for maintaining said lever arm in a generally upright position between the side-to-side limits of its travel movement, said means for maintaining said lever arm upright including a pin adapted to pass through a portion of said trunnion and thence at least partially through said tubular base, there being a pair of such pins, each positioned adjacent one of a pair of said trunnions, said lever arm further including a pair of laterally spaced hand grip portions positioned along the extent of said arm intermediate the ends thereof, signal means supported by said posts above said surface and separate longitudinally spaced activation means positioned on said surface between said pivot support and said stop means for contact by said arm just prior to movement to either of its side-to-side limits for activating said signal means, said activation means including a pair of switches positioned along said median line for contact by said lever arm and said signal means activated upon contact between said lever arm and either of said switches.

4,577,858

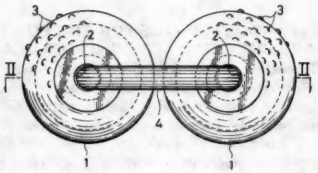
FINGERTIP EXERCISER

Masanobu Higami, 14-10 2-chome, Takarazuka-shi, Asahi-machi, Hyogo-ken, Japan

Filed Sep. 4, 1984, Ser. No. 646,808

Int. Cl.[4] A63B *23/00*

U.S. Cl. 272—67 **1 Claim**



1. A fingertip exerciser, comprising in combination:

(a) a synthetic resin pair of deformable balls (1), each ball having a bore (2) extending centrally therethrough and an outer peripheral ball surface where the portion of the ball surface surrounding each end of the bore is a planar surface, each ball of said pair being formed of two hollow hemispheres force fitted one onto the other with a vacant chamber (5) therein;

(b) a multiplicity of rounded projections (3) on said peripheral surface; and,

(c) a connector (4) comprising a pair of U-shaped bars, each having a tenor at one end and a mortice at the other end, the bars being joined together into a rectangular shape to form said connector, the outer ends being force fitted one into the other within the bores of each ball, wherein the connector and bores are sized so as to permit the balls to be deformable while being rotated.

4,577,859

IN-PLACE SWIMMING APPARATUS

Burnham N. Gossett, 2919 S. Lakeridge Trail, Boulder, Colo. 80302

Filed Sep. 30, 1983, Ser. No. 537,524

Int. Cl.[4] A63B *31/00*

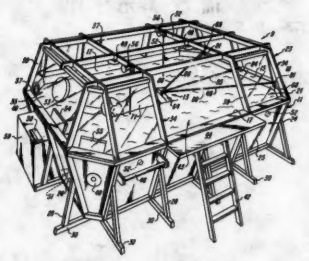
U.S. Cl. 272—71 **18 Claims**

1. A device for in-place swimming, said device comprising:

structural tank defining means having a first portion with dimensions to contain a predetermined quantity of liquid just sufficient to enable an in-place swimmer to execute strokes common to normal swimming without appreciable extra liquid quantities being contained by said first portion, and a second portion for providing at least support means contiguous to said first portion; and

restraint means having a first portion including belt means adapted to be releasably secured about the body of a swimmer in said liquid, and slidable fastening means having a first unit extending along said belt means a distance sufficient to substantially span the width of the body of a swimmer wearing said belt means with said first unit being connected with said first portion of said restraint means

adjacent to the opposite sides of the width of the body of a swimmer wearing said belt means, and a second unit cooperable with said first unit to allow sliding movement of said second unit substantially entirely along said first unit between said connections of said first unit to said first portion of said restraint means so that said second unit can slide along substantially the entire width of the body of a swimmer, and said restraint means also having a second portion physically connected with said support means and said second unit of said slidable fastening means, said



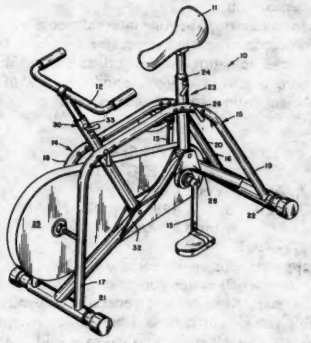
second portion of said restraint means including force means for at least exerting a force on a swimmer opposing forward movement of said swimmer from a predetermined position in said liquid due to the forwardly force exerted by said swimmer when executing said strokes common to normal swimming so that said swimmer, when secured to said restraint means, is able to swim in a normal manner and yet remain substantially in place in said liquid to thereby avoid contact with said structural means while swimming in said normal manner.

4,577,860

ADJUSTABLE EXERCYCLE FOR PROVIDING SIMULATED RUNNING EXERCISES

René Matias, 2414 Fidelidad St., Hacienda Heights, Calif. 91745; Leroy R. Perry, Jr., 3283 Motor Ave., Los Angeles, Calif. 90034

Filed Jul. 6, 1984, Ser. No. 628,644
Int. Cl.[4] A63B *21/00, 69/16*
U.S. Cl. 272—73 **6 Claims**



1. An exercising apparatus for simulating the riding of a exercycle which includes a seat, a set of handlebars and a pair of pedals, said exercising apparatus comprising:

a. a frame including a first inverted U-shaped member and a second inverted U-shaped member which is parallelly disposed to said first inverted U-shaped member, each of said first and second inverted U-shaped members having a front leg and a rear leg, and a first base member which is fixedly coupled to said front leg of said first and second inverted U-shaped members and a second base member which is fixedly coupled to said rear leg of said first and second inverted U-shaped members;

b. an inverted V-shaped supporting member having a front leg which is fixedly coupled to said first base member and a rear leg which is fixedly coupled to said second base member;

c. driving means for providing a user with resistence to driving in response to his movement of the pair of pedals, said driving means being mechanically coupled to said inverted V-shaped supporting member and to said first and second inverted U-shaped members;

d. handlebar mounting means for mounting the set of handlebars, said handlebar mounting means being mechanically coupled to said inverted V-shaped supporting member and to said first and second inverted U-shaped members;

e. pedal mounting means for mounting the pair of pedals, said pedal mounting means being mechanically coupled to said inverted V-shaped supporting member;

f. a seat support pole which is adjustably coupled to the seat;

g. first pivotal mounting means for pivotally coupling said seat support pole at multiple angles to said inverted V-shaped supporting member; and

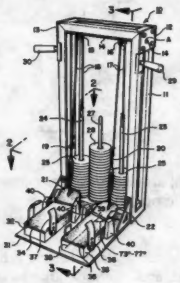
h. first locking means for adjustably locking said seat support pole in place to said first and second inverted U-shaped members.

4,577,861

EXERCISE MACHINE FOR LIMB EXTREMITY DIGITS

Blauer L. Bangerter, and James M. Streeter, both of Provo, Utah, assignors to Brigham Young University, Provo, Utah

Filed Jun. 4, 1984, Ser. No. 617,081
Int. Cl.[4] A63B *23/04*
U.S. Cl. 272—96 **12 Claims**



1. A digits' exerciser device including, in combination: a fixed, limb extremity planar platform having an upper surface; a movable digits' support member having an upper planar surface essentially disposed, when at a medial-point operative position, in the same plane of said platform upper surface; transversely disposed pivot means pivotally mounting said support member proximate said platform at a common juncture for lateral pivotal movement of said digits' support member, relative to said platform, in accordance with digits' pressure thereon; strap means coupled to said support member and positioned and dimensioned for constraining said limb extremity to and against said platform at a position such that the metacarpal/metataursal phlangeal joints of such digits are proximate the said juncture of said platform and said digits' support member; and means for selectively, progressively resisting said digits' pressure coupled to said digits' support member.

2. A digits' exerciser device including, in combination: a fixed, limb extremity platform having an upper surface; a mov-

able digits' support member having an upper surface essentially disposed, when at a medial-point operative position, in the same plane of said platform upper surface; transversely disposed pivot means pivotally mounting said support member proximate said platform for lateral pivotal movement of said digits' support member, relative to said platform in accordance with digits' pressure thereon; and means for resisting said digits' pressure coupled to said digits' support member, and wherein said resisting means comprises a flexible elongate connector laterally coupled at one end to said digits' support member, a fixed pulley supporting said flexible elongate connector intermediate its ends, and weight means coupled to said flexible elongate connector at its remaining end for resisting said digits' support member toward the latter's original position.

4,577,862

ISOKINETIC EXERCISE APPARATUS AND METHOD

Steven M. Sagedahl, 4814 37th Ave. South, Minneapolis, Minn. 55414

Filed Jan. 30, 1984, Ser. No. 575,209
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—125 11 Claims

1. An exercise apparatus for a person, comprising:
a shaft rotatable about a first axis;
means for resisting the rotation of said shaft;
a torque arm;
first means for connecting said torque arm to said shaft such that said torque arm is nonparallel to said first axis;
means for unrestrainably sliding on said torque arm;
second means for connecting said sliding means to said person, said second connecting means including means for moving in rotation; and
means for attaching said second connecting means to an extremity of said person.

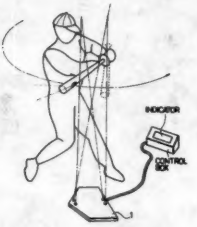
10. An apparatus for isokinetically exercising muscles used while hitting a baseball, said apparatus comprising:
a rotatable shaft;
an arm for applying a torque to said shaft;
means for attaching said torque arm to said shaft so that said arm is non-parallel to said shaft;
means for applying at a predetermined angular speed a counter torque to said shaft;
means for adjusting the angular speed at which said applying means applies counter torque;
a baseball bat for an exercising person to swing;
a flexible member;
means for connecting said flexible member to said torque arm, said connecting means including means for unrestrainably sliding along said torque arm; and
means for fastening said flexible member to said baseball bat.

4,577,863

SWING MEASURING DEVICE

Sho Ito; Kenji Tatsumi; Kumio Kasahara; Tomoyuki Nakaguchi; Toshio Takei, and Shojiro Nakahara, all of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 1, 1983, Ser. No. 510,098
Claims priority, application Japan, Jul. 1, 1982, 57-114623
Int. Cl.[4] A63B *71/02*
U.S. Cl. 273—26 R 19 Claims



1. A swing measuring device, comprising:
a laser oscillator disposed in a sensor unit, and optical means for splitting the output laser beam of said laser oscillator into first, second, third and fourth laser beams;
said optical means being arranged such that first and fourth laser beams are emitted in a manner such that said first and fourth laser beams are spaced from one another and are emitted perpendicularly to said sensor unit, said second laser beam is emitted from substantially the same location of said sensor unit as that from which said first laser beam is emitted, in a manner such that said second laser beam intersects said fourth laser beam at a first predetermined height above said sensor unit, and such that said third laser beam is emitted from substantially the same location of said sensor unit, and such that said third laser beam is emitted from substantially the same location of said sensor unit as that from which said fourth laser beam is emitted, in a manner such that said third laser beam intersects said first laser beam at a second predetermined height above said sensor unit;
means for measuring the time intervals required for a swinging object to cross said respective four laser beams; and
means for calculating the height and inclination of said swinging object's swing plane and the speed of said swinging object from said time intervals.

4,577,864

BATTING AID

Michael A. Aldrich, Cool, Calif.

Filed Jun. 6, 1985, Ser. No. 741,967
Int. Cl.[4] A63B *69/40*
U.S. Cl. 273—26 E 6 Claims

1. An apparatus for improving the eye hand coordination of a softball or baseball batter comprising:
a handle, adapted to be held generally vertically,
a flexible rod mounted in said handle for rotational movement about a generally vertical axis, said rod including a terminal portion mounted in said handle, and a main body portion extending 90° from said terminal portion, and having a distal end in the main body portion,
a rope having a first portion and a second portion, the first portion being longer than the second portion, and the second portion being shorter than the main body portion of the rod, said main portion of the rod being disposed within said rope's first portion, and

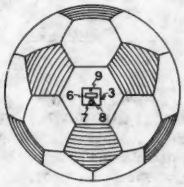
a ball simulating a baseball or softball attached to the end of the second portion of the rope dangling from the distal end of the rod,

whereby upon swirling of the handle vertically the flexible rod rotates in a generally horizontal plane, and the dangling portion of rope with the ball attached moves by centrifugal force outwardly toward a horizontal disposition for a batter to hit the ball.

4,577,865
ATHLETIC BALL

Hideomi Shishido, Hiroshima, Japan, assignor to Molten Corporation, Hiroshima, Japan

Filed Jun. 13, 1984, Ser. No. 620,289
Claims priority, application Japan, Jun. 16, 1983, 58-109053; Mar. 26, 1984, 59-58978
Int. Cl.⁴ A63B *41/00*
U.S. Cl. 273—58 G **19 Claims**



1. An athletic ball, comprising:

(a) a ball having an airtight bladder for giving impact resilience to the ball in which compressed air is charged through an air injection valve,

(b) a concave housing provided within the ball on the opposite portion of the ball from the valve and contacting the surface of the bladder while maintaining the airtightness of the bladder,

(c) means for detecting an external force applied to the ball and generating a signal in response thereto,

(d) operation means for converting the signal from the detecting means into a numerical information signal relating to the external force applied to the ball,

(e) means for displaying the numerical information obtained in the operation means, and

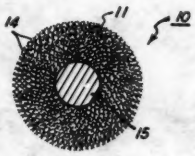
(f) a battery power source for driving the above means, said detecting means, operation means, displaying means and battery power source being accommodated in the housing, and the sum of the weight of the housing, the detecting means, the operation means, displaying means and battery power source being substantially the same as the weight of the valve, and said weight sum being small enough such that said housing and elements disposed therein do not substantially interfere with the impact resilience of the ball.

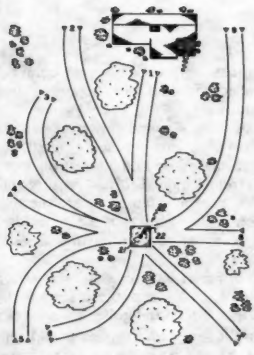
4,577,866
Patent Not issued For This Number

4,577,867
SHORT FLIGHT GOLF BALL AND GAME

John W. Lenhart, Hilton, N.Y., assignor to Lenkin Ltd., Rochester, N.Y.

Filed Nov. 9, 1983, Ser. No. 550,179
Int. Cl.⁴ A63B *67/02, 37/14*
U.S. Cl. 273—176 AB **17 Claims**





1. A short flight golf ball comprising:

a. a spherical foam body approximately the size of a regulation golf ball for hitting with regulation golf clubs;

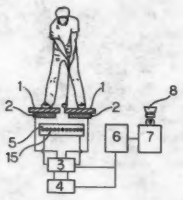
b. said foam body being formed of reticulated resinous veins;
c. a core weighing substantially less than a regulation golf ball;
d. said core being substantially smaller than a regulation golf ball;
e. said core being located in the center of said foam body;
f. said reticulated veins being severed at the spherical exterior of said foam body; and
g. said reticulated veins in the region between said core and said severed exterior having a sufficient void volume so that air moves through voids between said veins as said ball flies through air, and air movement relative to said reticulated veins produces sufficient aerodynamic drag to make the flight of said ball substantially shorter than the flight of a regulation golf ball.

4,577,868

GOLF SWING TRAINING DEVICE WITH VISUAL AND AUDIBLE ALERTS

Norio Kiyonaga, 4-13-1 Iwatominami, Komae-shi, Tokyo, Japan

Filed Apr. 9, 1984, Ser. No. 598,459
Claims priority, application Japan, Apr. 15, 1983, 58-65284
Int. Cl.[4] A63B *69/36*
U.S. Cl. 273—183 A **2 Claims**



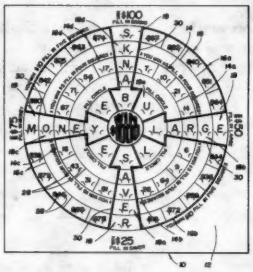
1. A golf swing practice device, comprising:
a pair of address plates for supporting the two feet of a golfer at address;
a pair of sensors operatively positioned beneath said pair of address plates for producing signals corresponding to the weight placed on said address plates;
a first circuit coupled to said sensors and including a memory element adapted to record the relative weight distribution of the two feet of the golfer during the course of a golf swing in response to the signals produced by said sensors;
a second circuit including a first sound generating element operative to develop signals for a first sound representing a state in which the golfer's weight is properly shifted to the right foot and a second sound representing a proper timing at which a downswing is initiated upon completion of a backswing by the golfer, and a second sound generating element operative to develop a third sound representing a state wherein the golfer's weight is properly shifted to the left foot, and sound means for generating said first, said second and said third sounds; and
regulator means associated with said first sound generating element for enabling an interval of time between said first and said second sounds to be adjusted by the golfer.

4,577,869

PROMOTIONAL GAME

Winford L. Brinkman, 20135 S. Greenway, Southfield, Mich. 48076

Filed Feb. 1, 1985, Ser. No. 697,565
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—269 **10 Claims**



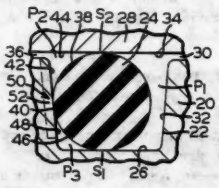
1. A promotional game comprising: a game card having a first set of indicia arranged in a circular shape; a second set of indicia arranged on the game card in a circular shape around the first set of indicia in a concentric relationship; a third set of indicia on the game card extending radially between the first and second sets of indicia at angularly spaced locations from each other; each set of indicia including at least one series of distinctive markings; game tickets having selected indicia corresponding to the indicia of the first, second, and third sets such that a prize is won by matching tickets with the markings of any series of indicia on the game card; and means for securing the game tickets to the card over the appropriate markings.

4,577,870

O-RING SEAL IN CHANNEL WITH FLUID PRESSURE EQUALIZATION MEANS

Daniel G. Scott, Swissvale, and Theodore B. Hill, N. Versailles, both of Pa., assignors to American Standard Inc., Wilmerding, Pa.

Filed Feb. 13, 1984, Ser. No. 579,311
Int. Cl.[4] F16J *15/48*; F15B *13/042*
U.S. Cl. 277—1 **44 Claims**



1. A sealing apparatus to maintain fluid sealing between

members in a fluid flow control application in which the sealing member is subjected to an application of a differential pressure on opposite sides thereof, said sealing apparatus comprising:

(a) a first member having at least one generally U-shaped channel formed in said first member;

(b) a deformable O-ring sealing member positioned at least partially within said U-shaped channel in sealing contact with a point on the bottom surface of said U-shaped channel to form a first seal between said first member and said O-ring sealing member, said first seal being maintained throughout an application of pressure on aaid O-ring sealing member;

(c) a second member positioned to have sealing contact with said O-ring sealing member to form a second seal between said second member and said O-ring sealing member at a point on said O-ring sealing member substantially diametrically opposite said first seal, said second seal being maintained throughout such application of pressure on said O-ring sealing member to allow a differential pressure on opposite sides of said O-ring sealing member located between said maintained first seal and said maintained second seal;

(d) said maintained first seal and said maintained second seal preventing fluid leakage from one side of said O-ring sealing member to the opposite side of said O-ring sealing member;

(e) said deformable O-ring sealing member having a cross-section such that at least one point on said cross-section which is intermediate said first seal and said second seal and is on the low pressure side of said O-ring sealing member is closely adjacent one side wall of said U-shaped channel and wherein contact of said at least one point with said U-shaped channel side wall establishes at least two pressure zones on said low pressure side of said O-ring sealing member; and

(f) a fluid communication means for providing fluid communication between said at least two pressure zones, said fluid communication means positioned adjacent said side wall of said U-shaped channel and said at least one point whereby said fluid communication between said at least two presusre zones will substantially equalize the pressure on said low pressure side of said O-ring sealing member between said substantially diametrically oppositely maintained first seal and second seal.

4,577,871

DEVICE FOR COUPLING TWO SHAFTS OF A ROTATING MACHINE FOR HEAT TRANSFER AND SEALING

Erich Weghaupt, Mulheim an der Ruhr; Lutz Intichar, and Christoph Schnapper, both of Erlangen, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim an der Ruhr, Fed. Rep. of Germany

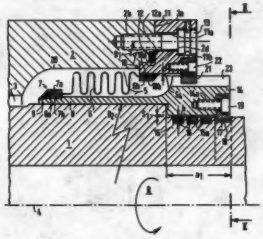
Filed Feb. 27, 1985, Ser. No. 706,045

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1984, 3407275

Int. Cl.⁴ F16J *15/00;* **H02K** *9/00*

U.S. Cl. 277—8 **8 Claims**

1. Device for coupling two shafts of a rotating machine for permitting simultaneously a thermal dilatation and a sealing of the shafts with respect to each other, in combination with the shafts, comprising inner and outer normally synchronously rotating mutually concentric shafts defining a ring gap therebetween, at least said outer shaft being hollow defining a space between said shafts, an expansion compensator with a given maximal permissible twist disposed between the inner periphery of said outer shaft with one end and the outer periphery of said inner shaft with its other end sealing said space between said shafts and permitting relative axial, radial and tangential motion between said shafts, a holding ring rotatably and sealingly supported on said inner shaft connected sealingly to said other end of said expansion compensator thereby permitting a twisting movement thereof with respect to said inner shaft, and at least one driver element attached to said outer shaft engaging said inner shaft via said holding ring with tangential play (S_2) between said shafts being smaller than said given maximal



permissible twist, said driver element mechanically connecting said holding ring and said other end of said expansion compensator to said outer shaft when twists of said expansion compensator exceed said tangential play (S_2).

4,577,872

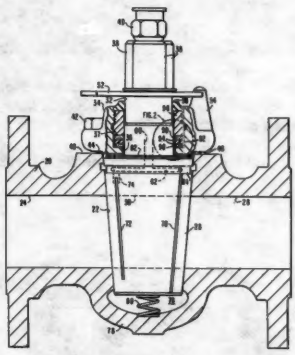
VALVE STEM SEAL WITH MULTIPLE RING MEANS

Earl A. Bake, Pittsburgh, and Clair W. Hartle, Jr., Monroeville, both of Pa., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 637,186, Aug. 2, 1984, abandoned. This application Sep. 10, 1985, Ser. No. 774,622

Int. Cl.⁴ F16J *15/06, 15/30;* **F16K** *41/04*

U.S. Cl. 277—12 **5 Claims**



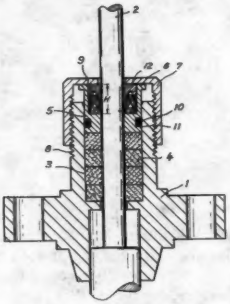
1. A lubricated plug valve having a housing comprised of a body and cover enclosing a chamber defined by a seating surface formed in said body, a plug seated on said surface and adapted to rotate between valve open and valve closed positions, a valve stem drive connected to said plug and projecting through said housing to the exterior thereof, a bore in said housing surrounding and radially spaced from said stem to provide an annular seal receiving chamber between said stem and said housing, a stem seal comprised of first ring means of carbonaceous material coated with a dispersion of PTFE with a latex binder in radial sealing engagement with said bore and said stem, second ring means of PTFE in radial sealing engagement with said bore and said stem and an annular gland projecting into and axially adjustable in said chamber for applying an axial load on said first and second ring means.

4,577,873

DUAL VALVE STEM PACKING ARRANGEMENT

Hans D. Baumann, 32 Pine St., Rye, N.H. 03870

Filed Mar. 29, 1985, Ser. No. 717,834
Int. Cl.[4] F16J *15/24*
U.S. Cl. 277—110 **3 Claims**



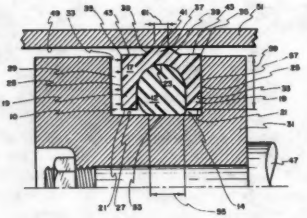
1. Dual packing arrangement comprising a valve stem sealingly engaging one lower set of packing rngs and one upper set of packing rings, a slidingly arranged packing follower engaging and capable of compressing said lower packing ring set, said packing follower having a cylindrical recess of pre-determined depth to house the upper set of packing rings, a valve bonnet having a recessed chamber snuggly containing within said set of lower packing rings and allowing for sliding engagement of said packing follower, additional means to motivate said packing follower against said set of lower packing rings having a shouldered portion over-lapping and closing the cylindrical recess in said packing follower.

4,577,874

SEAL ASSEMBLY

Gordon T. Zitting, Sandy, Utah, assignor to Microdot Incorporated, Chicago, Ill.

Division of Ser. No. 503,941, Jun. 13, 1983, Pat. No. 4,566,703, which is a continuation-in-part of Ser. No. 257,045, Apr. 24, 1981, which is a continuation-in-part of Ser. No. 58,341, Jul. 17, 1979, abandoned, which is a continuation of Ser. No. 883,448, Mar. 6, 1978, abandoned. This application Jul. 16, 1985, Ser. No. 755,639
Int. Cl.[4] F16J *15/24*
U.S. Cl. 277—165 **2 Claims**



2. A two compression seal assembly, solely made up of two elements, for use between two closely spaced relatively reciprocable machine parts, the first of the machine parts having a radial groove comprising spaced sidewalls and a base between the sidewalls, the assembly comprising:

an endless relatively soft annular spring element of yieldable material with memory and having a solid cross-sectional configuration;

an endless annular sealing element comprising a house-shaped body of relatively hard wear resistant synthetic resinous material having a generally U-shaped cross-sectional configuration;

said sealing element further comprising spaced radially directed elongated anti-extrusion and anti-roll legs, the length of said elongated legs being coextensive with substantially the entire adjacent sidewall, a thin separation existing between the end of each elongated leg and the base of the groove, the spring element being positioned between and extending radially beyond the ends of the elongated legs across said thin separation to compressively engage the base while preserving the thin separation thereby accommodating creation of a first static seal solely and directly between the extended part of the spring element and the base of the groove in the first machine part, the interior surface formed by and between the elongated legs being contiguous with in excess of fifty percent of the exterior surface of the spring element, a second static seal being formed solely and directly between one exterior elongated leg surface and substantially all of one sidewall of the groove so that at all times, when under pressure from one side or the other of the seal assembly, the elongated leg away from the pressure is caused to be contiguous with essentially the entire surface of the adjacent sidewall and at all times the elongated leg at one element only entirely prevents the other element in the form of said spring from reaching the sidewall of the groove;

said house-shaped sealing element further comprising a delta-shaped projection having central disposed thin apex means, the projection extending radially away from said anti-extrusion and anti-roll legs and beyond said groove, the apex compressively engaging the surface of a second machine part in such a fashion so as to cause said apex to no more than slightly flattened solely at the tip region thereof and to create an annular line dynamic seal solely along the entirety of the 360 degrees of said slightly flattened tip region whereby a surprisingly high stable pressure resistance is developed in excess of any hydraulic or pneumatic pressure applied to the seal assembly;

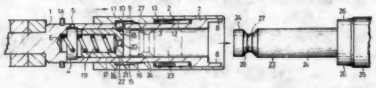
said delta-shaped projection extending radially and the tip portion thereof having an undulating surface when in an unstressed condition.

4,577,875

EXCHANGE CHUCK FOR A TOOL

Eiji Miyakawa, Tokyo, Japan, assignor to Miyakawa Industry Co., Ltd., Seki, Japan

Filed Oct. 29, 1982, Ser. No. 437,615
Int. Cl.[4] B23B *31/22*
U.S. Cl. 279—75 **9 Claims**



1. An exchange chuck for a tool such as a drill, said tool including a tool shank which may be extractably introduced into the chuck and which has a shank portion with first and second ends and an exchange inhibit groove proximate the first end of the shank portion, said chuck comprising;

a spindle having a tubular portion with a mounting bore in which the shank portion may be introduced;

a connecting means provided to the second end of said shank portion and said tubular portion and operable upon insertion of said shank portion into said mounting bore to cause rotation of said tool shank in unison with said spindle;

ejector means in the form of a roofed cylinder received in a bottom end of said mounting bore and being adapted to

eject said tool shank, said ejector means having an annular groove formed on the outer peripheral edge of said cylinder and an engaging step formed at one end of said annular groove;

a coil spring interposed between the roof of said cylinder and the bottom end of said mounting bore for perpetually biasing said ejector means in a first longitudinal direction;

at least one ball mounted in said tubular portion; and

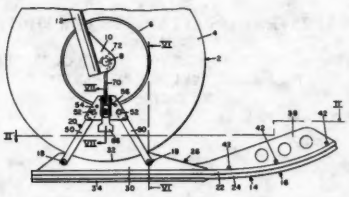
a movable sleeve received on said tubular portion for movement longitudinally thereof, said sleeve having an undercut annular groove formed on the inner periphery of said movable sleeve and said undercut annular groove including cam means on one end thereof, said sleeve being adapted through longitudinal movement to cause said ball to be moved radially into said mounting bore between first and second positions, said ball being operative when intruded into said mounting bore in said first position to engage with the extraction inhibit groove of said tool shank to inhibit extraction of said tool shank and operative when intruded into said mounting bore in said second position upon removal of the tool shank to engage said engaging step of said annular groove in said ejector means to inhibit extraction of said ejector means in said first longitudinal direction.

4,577,876

SKI ATTACHMENT FOR VEHICLE WHEELS

Walter L. Harris, 9736 Reeder, Overland Park, Kans. 66214

Filed Feb. 14, 1985, Ser. No. 701,919
Int. Cl.[4] B62B *19/02*
U.S. Cl. 280—13 **5 Claims**



1. A ski attachment for a non-driven, free-turning vehicle wheel having a compressible tire, said attachment comprising:

a. a ski having a substantially straight rear portion and an upwardly curved front portion, and adapted to be positioned beneath said wheel parallel to the line of travel thereof,

b. a rigid cradle member affixed to the top surface of said straight rear ski portion, the top of said cradle member being configurated to receive and support the lower portion of said tire therein, and

c. tension means detachably interconnecting said cradle member with an axle of said wheel, and manually operable to draw said cradle member into compressing engagement with said tire, whereby said ski is held in substantially fixed relation to said tire, said tension means comprising:

(1) a pair of straps secured at their lower ends to said cradle member respectively adjacent the forward and rearward ends of the latter, and converging upwardly in a plane parallel to the plane of the wheel, there being a pair of said straps at each of the respectively opposite sides of the cradle,

(2) a plate secured to the upper ends of each of said pairs of straps,

(3) a pair of hooks disposed at the respectively opposite sides of said tire, each detachably engageable at its upper end over the axle of said wheel, and extending downwardly therefrom, and

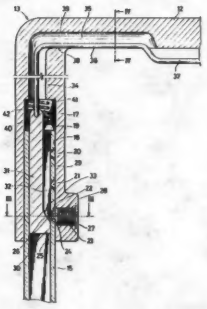
(4) a toggle link interconnecting each of said plates to the lower end of the associated hook and manually operable both to extend said hook upwardly when open, and to retract said hook downwardly when closed, and to lock said hook releasably in said retracted position.

4,577,877

PUSHCART HANDLE HEIGHT ADJUSTING MECHANISM

Kenzou Kassai, Osaka, Japan, assignor to Kassai Kabushikikaisha, Osaka, Japan

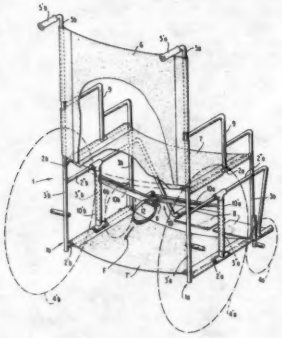
Filed Jun. 10, 1985, Ser. No. 742,887
Claims priority, application Japan, Jun. 22, 1984, 59-93944[U]
Int. Cl.[4] B62B *7/08*
U.S. Cl. 280—47.37 R **2 Claims**



1. A pushcart handle height adjusting mechanism comprising: a horizontally extending handle portion having hollow cylindrical right and left upper rod portions extending downwardly from the right and left ends of said handle portion, right and left lower hollow rods adapted to be respectively received within the inner wall surfaces of said right and left upper rod portions for slidably supporting said upper rod portions, a plurality of locking holes formed in the wall of each of said right and left lower rods, said locking holes being arranged in vertical alignment and at predetermined intervals, right and left locking pins located within the walls of said upper rod portions and adapted to slide in a direction at right angles to said wall surfaces, said locking pins having respective shaft portions capable of extending through said locking holes into the hollow interior portion of said right and left lower rods, one of said locking holes and said locking pins having an inclined surface permitting the entry and exit of said locking pins into said locking holes, right and left locking springs for urging said right and left locking pins to move toward said right and left lower rods, respectively, right and left slide rods slidably installed within the hollow interior portion of said right and left lower rods and said right and left upper rod portions, a connecting rod disposed along said upper rod and connected at its opposite ends to said right and left slide rods, said connecting rod being vertically movable between upper and lower positions with respect to said handle, and spring means for urging said connecting rod and said right and left slide rods to move downwardly, said right and left slide rods being formed with inclined surfaces such that when said right and left slide rods are located at a lower position, the inclined surfaces are positioned below the level of the shaft portions of said right and left locking pins, and when said right and left slide rods are slid upwardly, said inclined surfaces abutt against the shaft portions of said right and left locking pins which project beyond the inner wall surfaces into the hollow interior portion of said right and left lower rods, and when said right and left slide rods are located at an upper position, said inclined surfaces are positioned above the level of the shaft portions of said right and left locking pins, wherein said shaft portions are displaced from the interior of said lower rods when said connecting rod is moved to said upper position thereby permitting

said shaft portions to move along the outer wall surfaces of said lower rods for vertical adjustment of said handle.

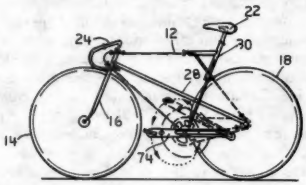
4,577,878
FOLDING WHEELCHAIR
Jehan Roy, and Jean Dubois, both of Tours, France, assignors to Lacoste, SA, Tours Cedex, France
Filed May 29, 1984, Ser. No. 614,787
Claims priority, application France, May 30, 1983, 83 09612
Int. Cl.[4] B62B *11/00*
U.S. Cl. 280—242 WC **4 Claims**



1. A folding wheelchair comprising a framework, a seat and a backrest mountd on said framework, two front caster wheels permitting steering and two large rear wheels permitting propulsion, said framework comprising two symmetrical rectangular side frames mounted to be moved away or brought back by means of a jointing device, each of said rectangular side frames comprising at least one lower and one upper horizontal sidebar spaced by means of one front and one rear vertical side-bar, said jointing device comprising a compass-member having two legs whose outer ends are rotatively mounted around two parallel supporting pins, each of which is disposed within the corresponding side frame and said framework parallel to and spaced between two of said parallel side-bars of the associated said side frame, the inner ends of said legs being pivotally interconnected by a joint, two pieces of canvas, said two pieces being parallelly stretched between the lower and the upper horizontal side-bars of said side frames, said two pieces of canvas being located on opposite sides of the compass-member and one of said pieces of canvas comprising said seat, one of said legs of the compass-member of the jointing device comprising a shoulder located at the joint, said shoulder overlapping a portion of the end of the other leg when the compass is extended, whereby said shoulder limits the extending movement of the compass-member, said shoulder abutting said other leg when said legs have passed overcenter upon extension of the compass-member, the canvas of said seat being tensioned in the extended position of the compass-member, the tension in the canvas preventing unwanted collapse of the compass-member.

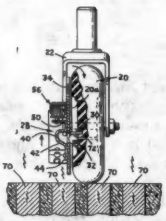
4,577,879
BICYCLE
Franciscus A. Vereyken, 397 Wainwright Ave., San Jose, Calif. 95128
Filed Sep. 19, 1983, Ser. No. 533,829
Int. Cl.[4] B62M *1/04*; B62K *15/00*
U.S. Cl. 280—256 **11 Claims**

1. A bicycle comprising: a frame; a front wheel and a rear wheel rotatably mounted on the frame; a chain and sprocket assembly coupling the frame and the rear wheel to allow for forward movement of the wheels over a surface, said assembly including a sprocket and a pair of cranks rotatably mounted on the frame and coupled to the sprocket; and a pair of bars, there being a bar for each crank, respectively, each bar having a front end and a rear end and a longitudinal slot near the rear end thereof, each crank having an outer end pivotally coupled to the corresponding bar near to but spaced from the front end of the respective bar, there being a pedal on the forward end of each bar, respectively, and pin means carried by the frame and



shiftably received within the slot of the respective bar for pivotally coupling the rear part of the respective bar to the frame, each bar permitting the respective pedal to follow a generally semicircular path when the pedal moves during its power stroke from the top of its arc forwardly and then downwardly to the bottom of its arc, each pedal traversing a curved, substantially vertical path as it returns to the top of its arc from the bottom of its arc, whereby the pedal will return quickly to the top of its arc from said bottom of its arc.

4,577,880
THEFT PREVENTION APPARATUS FOR SHOPPING CARTS
Eric L. Bianco, 448 W. Second Ave., Roselle, N.J. 07203
Filed Jan. 6, 1984, Ser. No. 568,720
Int. Cl.[4] B62D *39/00*
U.S. Cl. 280—33.99 C **6 Claims**



1. Theft-prevention apparatus for a shopping cart of the type having body means, a plurality of wheels and wheel support means secured to said body means for rotatably supporting said plurality of wheels, said apparatus comprising:

a. stopper means secured to one of said wheels;

b. engagement means movable between a first inoperative position and a second operative position at which said engagement means is engageable with said stopper means, said engagement means including ball means movable between said first inoperative position and said second operative position at which said ball means is engageable with said stopper means; and

c. actuator means secured to said wheel support means for controlling movement of said engagement means from said first inoperative position to said second operative position for engagement with said stopper means in response to movement of said shopping cart in the proximity of a predetermined magnetic field to prevent rotation of said one of said wheels, said actuator means including plate means secured to said wheel support means and

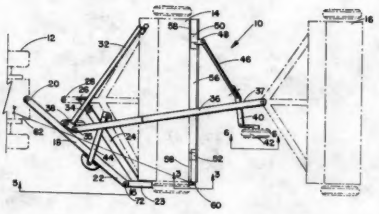
having a cut-out section defining an aperture, ball support means for supporting said ball means at said first inoperative position, and solenoid means secured to said plate means for moving said ball support means to a position adjacent said aperture in response to movement of said shopping cart in the proximity of said predetermined magnetic field to cause said ball means to move from said first inoperative position through said aperture to said second operative position, such that said ball means is wedged between said plate means and said stopper means upon continued rotation of said one of said wheels to prevent further rotation thereof.

4,577,881

IMPLEMENT HITCH ASSEMBLY

Jerome J. Gerber, Rte. 1, Box 32, Murdock, Kans. 67211

Filed Jun. 19, 1985, Ser. No. 746,274
Int. Cl.[4] B60D *1/00*
U.S. Cl. 280—412 **9 Claims**



1. An improved implement hitch assembly attached to the rear of a self-propelled pulling vehicle, the assembly towing a front implement and a rear implement in a tandem position when traveling on a roadway, the assembly towing the front implement in a side by side position with the rear implement when in the field, the assembly comprising:

a hitch bar having a first end adapted for pivot attachment to the pulling vehicle and a second end;

a draw bar laterally disposed to the direction of travel and mounted on the front of the first implement, the draw bar pivotally attached to the second end of the hitch bar, the draw bar mounted on a front wheel;

a side bar having a first end pivotally attached to the draw bar and a second end mounted on a rear wheel, the rear implement pivotally attached to the second end of the side bar;

a pivot arm havng a first end pivotally attached to the side bar and a second end pivotally attached to the hitch bar;

slide means attached to the rear of the first implement and the side bar for holding the rear implement in a tandem position; and

release means attached to the slide means for releasing the slide means and allowing the rear implement to move into a side by side position with the front implement.

4,577,882

TRACTOR TRAILER COMBINATION WITH A COUPLING CONNECTION

Kurt Kober, Kötz; Rudolf Wohrle, Tschenhausen-Rieden, and Robert Kohler, Kemnat, both of Fed. Rep. of Germany, assignors to Alois Kober KG, Kotz, Fed. Rep. of Germany

Division of Ser. No. 445,952, Dec. 1, 1982, Pat. No. 4,502,561.
This application Dec. 7, 1984, Ser. No. 679,462
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1981, 3149700
Int. Cl.[4] B60D *1/14, 1/06;* B62D *53/06*
U.S. Cl. 280—446 R **5 Claims**

1. A tractor-trailer combination which comprises:

a tractor vehicle provided with a coupling ball fixed rearwardly of a center of gravity of said vehicle beyond a rear end thereof;

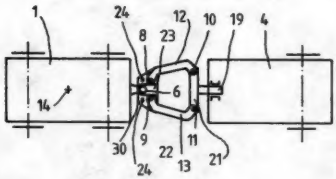
a trailer vehicle rearwardly of said tractor vehicle;

a hitch connecting said vehicles and being journaled on said trailer vehicle for rotation about a longitudinal axis thereof in a forward travel direction of said vehicles with said vehicles aligned in said travel direction, said hitch comprising:

a pair of bridge members spaced apart along said axis and extending generally transversely thereto,

means for mounting one of said bridge members on said ball,

means for journaling the other of said bridge members on said trailer vehicle for rotation relative to said trailer vehicle about said axis,



means defining respective pairs of pivots having vertical pivot axes on each of said bridge members athwart said longitudinal axis with the pair of pivots on the bridge member mounted on said ball, being more closely spaced than the pair of pivots on the bridge member journaled on said trailer vehicle, and

respective rigid links connecting corresponding pivots of each of said pairs whereby said links are disposed on opposite sides of said longitudinal axis and define with said bridge members a unit forming the hitch and coupling said vehicles together; and

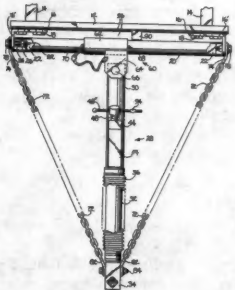
means for restricting swingability of the bridge member mounted on said ball about a vertical axis through said ball and relative to said ball.

4,577,883

VEHICLE TOW BAR

Lee H. Duncan, 88806 Greenhill Rd., Eugene, Oreg. 97402

Filed Jul. 13, 1984, Ser. No. 630,702
Int. Cl.[4] B60D *1/14*
U.S. Cl. 280—491 D **7 Claims**



1. For attachment to a vehicle to be towed, a vehicle tow bar, comprising:

(a) an elongated cross bar member configured for attachment to the front end of a vehicle to be towed and arranged to extend laterally across the front end thereof,

(b) a forwardly projecting reach mounted at its rear end centrally to the laterally extending cross bar, the reach comprising at least two longitudinally telescoping sections, the reach mounting at its forward end a coupler component of a trailer hitch,

(c) flexible tow line means connecting the forward end portion of the reach to the opposite ends of the laterally extending cross bar member, and

(d) securing means engaging the telescoping sections of the reach to releasably lock the sections in fully extended condition for releasably tensioning the flexible tow line means in taut, towing condition.

4,577,884

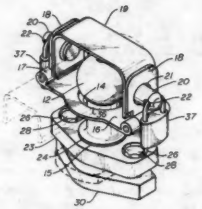
TRAILER HITCH

Joe L. Harris, Rte. 2, Box 2812, Porter, Tex. 77365

Filed Apr. 30, 1984, Ser. No. 605,461

Int. Cl.[4] B60D *1/12, 1/06*

U.S. Cl. 280—507 **8 Claims**



1. A safety and anti-theft locking device for use with ball and socket type couplings as may be used in the coupling of a tongue of a trailer to a towing vehicle tow bar comprising:

a. a tow ball characterized by a ball, a shank, a shoulder, a threaded shaft and a nut therefore;

b. a yoke means having a central bore therethrough and through which rests the shank, the diameter of said bore being large enough to loosely encircle said shank but smaller than the diameter of said ball thereby not allowing said yoke means to be removed over said ball so that said yoke means will rotate freely about said shank in conjunction with the trailer tongue;

c. a locking hat means placed over the trailer tongue and removably affixed to said yoke means so that when said locking hat means is coupled to said yoke means the ball socket of the trailer tongue cannot become disengaged from said ball and said locking hat means will rotate about said ball in unison with the ball socket.

4,577,885

TRAILER COUPLING

Johann Breu, Munich, Fed. Rep. of Germany, assignor to Rockinger Spezialfabrik für Anhängerkupplungen GmbH & Co., Fed. Rep. of Germany

Filed Dec. 6, 1984, Ser. No. 678,649

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1983, 3345474

Int. Cl.[4] B60D *1/02*

U.S. Cl. 280—508 **6 Claims**

1. Trailer coupling, comprising:

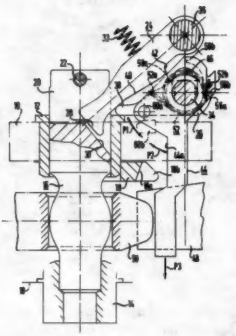
(a) a coupling body;

(b) a coupling bolt which is guided displaceably in the coupling body between a coupling position with engagement through a towing eye and a non-coupling position permitting the driving of the towing eye into and out of the coupling body;

(c) an opener lever pivotable about an opener lever pivot spindle and stressed by first spring means in the direction towards a securing position in which it secures the coupling bolt in its coupling position, which opener lever is transferrable by means defining an actuating shaft against the action of the first spring means into a holding position in which it holds the coupling bolt in the non-coupling position;

(d) a support lever pivotable about means defining a support lever pivot spindle, for supporting the opener lever in its holding position; and

(e) a release lever pivotable about the support lever pivot spindle, displaceable transversely of this spindle and subject to the turning and displacement effect of further spring means, which release lever in the entry and exit of the towing eye runs through different sequences of operational positions and in the course of the operational position sequence effected by the entry of the towing eye transmits a release moment to the support lever in the direction of cancellation of its supporting function, characterized in that



(f) the actuating shaft is offset parallel in relation to the opener lever pivot spindle;

(g) the support lever is seated non-rotatably and non-displaceably on the actuating shaft and is in entraining engagement with the opener lever so that in pivoting out of a rest position into a support position it entrains the opener lever out of its securing position into its holding position;

(h) the release lever is mounted rotatably and displaceably on the actuating shaft; and

(i) on the support lever and the release lever there are fitted release moment transmission stops which, when the towing eye is moving out, shifting the release lever, pass into a mutual readiness position, and when the towing eye is entering, transmit a pivot release movement from the release lever to the support lever.

4,577,886

ADJUSTABLE FLEX SKI

John O. Chernega, P.O. Box 1094, Taos, N. Mex. 87571

Filed Jul. 26, 1984, Ser. No. 634,554

Int. Cl.[4] A63C *5/07*

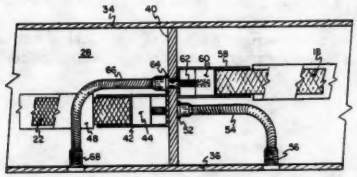
U.S. Cl. 280—602 **4 Claims**

1. An adjustable flex ski comprising:

a ski body including a foam core, upper and lower load-bearing surfaces, sidewalls, and a neutral plane, and having a center section, a shovel section and a tail section; and

first, second and third elongate flexible tensile members slidably embedded in said foam core below the neutral plane of the ski and located respectively in said center, shovel and tail sections of said ski, each of said tensile members having opposite ends and being affixed to the ski at said opposite ends of the member, and further comprising three tension adjustment means associated respectively with said tensile members, each of said tension adjustment means including a thrust plate embedded in

said foam core, a hollow housing abutting said thrust plate, a tensile member anchor slidably engaged in said housing and affixed to one end of the respective tensile member, a threaded shaft engaged in said anchor and passing through said thrust plate for effecting longitudinal displacement of said anchor in said housing with consequent stretching or relaxation of the tensile member, and



manually operable drive means opening on the exterior surface of one of said sidewalls of said ski body for effecting rotation of said threaded shaft, said tension adjustment means being operable to selectively vary the tension in the tensile members, whereby the flex pattern of the ski as determined by the levels of tension in said tensile members may be selectively varied by adjustment of said tension members.

4,577,887

SAFETY SKI BINDING

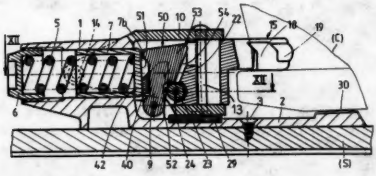
Roland Bardin, Varennes Vauzelles; Jean Bernard; Henri Peyre, both of Nevers, and Patrice Viodet, Imphy, all of France, assignors to Ste Look, Nevers, France

Filed May 31, 1984, Ser. No. 615,767

Claims priority, application France, Jun. 27, 1983, 83 10554

Int. Cl.⁴ A63C *9/08*

U.S. Cl. 280—628 **12 Claims**



1. A safety ski binding comprising a hollow body to be mounted on a ski, a yoke pivoted on said body about a horizontal cross-pin which extends transversely with respect to the ski, a boot-retaining jaw unit carried by the yoke and capable of lateral pivotal displacement on each side of the axis of the ski, a locking lever mounted within said body and pivoted about a horizontal cross-pin which extends transversely with respect to the ski, a spring housed within said body and adapted to produce action in opposition to the locking lever so as to ensure that said lever prevents lateral pivotal displacement of the jaw unit while at the same time preventing upward displacement of the assembly consisting of said jaw unit and said yoke by means of a guide ramp, wherein the jaw unit is guided in sliding motion within the yoke in the longitudinal direction of the ski and wherein said jaw unit is normally maintained stationary and prevented from moving in a lateral direction by two bearing means which are associated with said jaw unit and comprise:

a first bearing means directed toward the ski boot and adapted to cooperate with a first complementary support which is rigidly fixed to the yoke; and

a second bearing means directed away from the ski boot and adpated to cooperate with a second complementary support which is rigidly fixed to the locking lever; said first bearing means comprising a pair of vertical grooves cut in the jaw unit symmetrically with respect to the axis of the ski, said first support comprising a pair of vertical cylindrical rods attached to the yoke and spaced at a distance from each other which corresponds to the distance between said grooves, the jaw unit having a front extension on the side remote from the ski boot, said extension having a vertical opening having an approximately rectangular contour and traversed by said vertical cylindrical rods, and said grooves being cut in that wall of said opening which is located on the side remote from the ski boot.

4,577,888

SEAT BELT ANCHOR ASSEMBLY

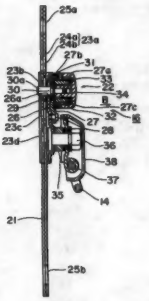
Juichiro Takada, 12-1, 3 chome, Shinmachi, Setagaya-ku, Tokyo, Japan

Filed Apr. 10, 1984, Ser. No. 598,841

Claims priority, application Japan, Apr. 11, 1983, 58-052666[U]

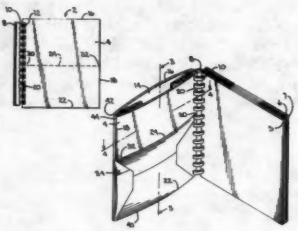
Int. Cl.⁴ A62B *35/00*; B60R *21/10*

U.S. Cl. 280—808 **3 Claims**



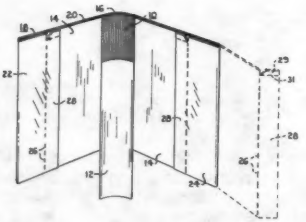
1. A seat belt anchor assembly comprising a rail having a plurality of holes spaced-apart in a row lengthwise of the rail, a slider movable along the rail and having a hole positioned to register with any selected one of the holes in the rail, a locking arrangement including a manually operable latch pin receivable through the hole in the slider and any selected one of the holes in the rail by which the slider is latched to the rail against movement from a selected position and an anchor ring connected to the slider for guiding the belt characterized in that the locking arrangement includes an operating assembly carried by the slider that includes a retainer affixed to the slider and having a cylindrical portion surrounding the latch pin and extending outwardly from the slider, a stop member affixed to the latch pin and received within the cylindrical portion of the retainer, at least one stop lug on the stop member engageable in a first rotational position of the latch pin with a stop shoulder on the cylindrical portion to prevent the pin from moving out of an engaged position in a hole in the rail and disengageable from the stop shoulder in a second rotational position of the latch pin to enable the pin to be disengaged from the selected hole in the rail, and a spring urging the latch pin and stop member axially toward the engaged position of the latch pin and rotationally toward the first rotational position of the stop lug.

4,577,889
BAG BOOK
Judith D. Schulz, 212 S. Fourth St., Delavan, Wis. 53115
Filed Apr. 20, 1984, Ser. No. 602,600
Int. Cl.[4] B42D *5/00, 13/00;* B31B *1/90, 1/60*
U.S. Cl. 281—15 R 18 Claims



1. A bag book comprising a plurality of bags bound together along an edge to provide a book, each bag forming a page of said book and providing a pocket in the interior of said bag;
wherein each said bag is open at the top and is closed at the right, left and bottom edges, and is bound at said left edge;
wherein said bags are folded upwardly to define an upwardly facing edge prior to binding, to form an auxiliary pocket between said upwardly facing edge and the body of the bag, such that each bag page comprises two pockets.

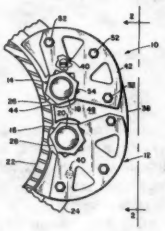
4,577,890
REMOVABLE BOOK MARKER STRIP
Gladys D. Boyett, 1418 Argyle Dr., Fort Myers, Fla. 33907
Filed Mar. 19, 1984, Ser. No. 591,119
Int. Cl.[4] B42D *3/00, 3/12, 3/04;* B42C *11/00*
U.S. Cl. 281—29 5 Claims



1. The combination with a book having a plurality of stacked pages and a binding securing one edge of the pages together as by gluing, sewing, etc., of covers overlying opposite sides of the stacked pages and secured in the binding, a dust shield overlying the binding and the covers and having inturned flaps, and perforations along the inner edges of one of the flaps to define a removable narrow book marker strip.

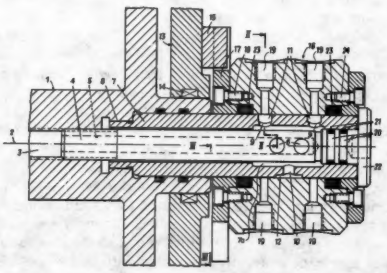
4,577,891
TORQUE LIMITING COLLAR
Lawrence E. Fielding, Enon, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Oct. 27, 1983, Ser. No. 546,222
Int. Cl.[4] F16L *25/00*
U.S. Cl. 285—62 4 Claims

1. A torque limiting collar for rigidly coupling a fitting to a stationary structure to prevent transmission of damage-inducing torque through said fitting to a conduit as a first portion of said fitting is rotatably adjusted against a second portion thereof to seal parts of said conduit together, said torque limiting collar comprising:
(a) a support member for rigid connection to said stationary structure between said stationary structure and said fitting;
(b) a locking member including means for engaging one of said first and second portions of said fitting to prevent said one fitting portion from rotating relative to said locking member; and
(c) means for rigidly fastening said locking member to said support member, said fastening means including,



means defining a first plurality of holes in said support member, and means defining a second plurality of openings in said locking member, said second plurality of openings being aligned with said first plurality of holes when said locking member engages said one fitting portion;
wherein said holes and openings in said respective first and second pluralities thereof are in the form of elongated slots orthogonally oriented to ensure alignment between said pluralities of holes and openings when said locking member engages said one fitting portion; and
a plurality of bolts received through said aligned holes and openings and rigidly connecting said support member and locking member together.

4,577,892
ARRANGEMENT FOR SUPPLYING A PRESSURIZED LIQUID TO A ROTATING MACHINE PART
Herwig Wrülich, Zeltweg; Franz Schöffmann, Leoben, and Wilfried Maier, Zeltweg, all of Austria, assignors to Voest-Alpine Aktiengesellschaft, Vienna, Austria
Filed Sep. 6, 1983, Ser. No. 529,743
Claims priority, application Austria, Sep. 9, 1982, 3382/82
Int. Cl.[4] F16L *39/00*
U.S. Cl. 285—136 8 Claims



1. In a machine including a stationary part and a rotatable part: apparatus for supplying pressurized liquid from the stationary part to the rotating part, said apparatus comprising a

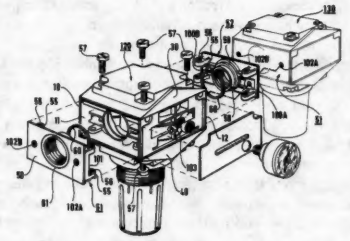
liquid supply tube extending from said stationary part into said rotatable part, said supply tube having a closed end within said rotatable part; a non-rotatable bushing surrounding said liquid supply tube arranged in sealing relationship with said rotatable part, said bushing defining with said supply tube, at a location within said rotatable part, an annular distributing chamber, said supply tube having at least one radial bore opening into said annular distributing chamber, said bushing having at least two radial bores in communication with said distributing chamber, said radial bores in said bushing being axially spaced apart and extending in opposite radial directions, and said rotatable part having liquid passages extending between the periphery of said rotatable part and the locations of said radial bores in said bushing.

4,577,893

CONNECTING CLAMP FOR PNEUMATIC APPARATUS

Pierre Bonino, Annecy; Christian Ducret, Annecy le Vieux, and Cyrille Mazzoleni, Rumilly, all of France, assignors to Compagnie Parisienne d'Outillage a Air Comprime, Bonneville, France

Filed May 4, 1984, Ser. No. 607,325
Claims priority, application France, May 4, 1983, 83 07406
Int. Cl.⁴ F16L *3/04*
U.S. Cl. 285—158 **5 Claims**



1. A connecting clamp for a pneumatic apparatus which comprises a substantially parallelepiped shaped body of plastic material associated with a bottom and with a lid which are placed on respective opposite faces of the body, wherein the clamp is constituted by a rectangular aluminum alloy plate of substantially the same size as one of the other faces of the body, against which it is applied, the clamp including a central tapped sleeve for making a pneumatic connection to other pneumatic equipment and lugs projecting perpendicularly from the plate, each lug having an orifice with its axis extending in a plane parallel to the plane of the plate and capable of receiving a rod or screw for fixing the clamp to the body, the rod or screw also passing through the lid or the bottom to fix the lid or the bottom to the body.

4,577,894

AXIAL COMPRESSION HOSE COUPLING

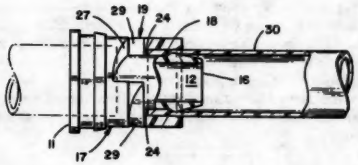
Harold E. Wake, 915 E. South Strathmore Ave., Lindsay, Calif. 93247

Filed Aug. 1, 1983, Ser. No. 519,083
Int. Cl.⁴ F16L *33/02*
U.S. Cl. 285—242 **10 Claims**

1. The combination of a coupling mechanism with a flexible hose of resilient material having an end portion of given wall thickness, said coupling mechanism comprising:

(a) a body having a nipple of rigid material projecting therefrom and received within said end portion of said hose, said nipple comprising a shank and a head, said shank having a right circular cylindrical exterior diameter substantially equal to the interior diameter of said end portion of said hose, said head having a maximum circular exterior diameter larger than said exterior diameter of said shank;

(b) a right circular cylindrical collar of rigid material surrounding said nipple and receiving said end portion of said hose, said collar having an interior diameter larger than said exterior diameter of said head of said nipple by an amount less than said given wall thickness of said end portion of said hose and an axial length shorter than the axial length of said shank of said nipple, said collar having an inwardly extending abutment member at one end thereof, said abutment member extending inwardly into close spaced relation less than said wall thickness of said end portion of said hose from said shank of said nipple, said collar being received on said nipple with said inwardly extending abutment member at the opposite end of said collar from said head of said nipple; and



(c) means when rotated urging said collar to move axially of said nipple toward said head thereof, said means being adapted to selectively maintain said collar at a given point in its movement toward said head of said nipple, said inwardly extending abutment member applying axial compressive force to said end portion of said hose compressing said end portion of said hose axially and causing the side wall thickness of said end portion of said hose between said head of said nipple and said abutment member of said collar to expand radially into sealing and gripping contact with the exterior surfaces of said shank and said head of said nipple and with the interior surface of said collar at said given point in said movement of said collar.

4,577,895

PIPE JOINT HAVING PRESSURE ACTIVATED SEALING MEANS

Alan J. Castille, Lafayette, La., assignor to Hub City Iron Works, Inc., Lafayette, La.

Filed Jan. 23, 1984, Ser. No. 573,216
Int. Cl.⁴ F16L *15/00*
U.S. Cl. 285—334 **6 Claims**

1. In a stepped-thread pipe connector, including a pin and box member with a tapered metal seal seat formed at the end of a pin member fitting in sealed relation with a complementary metal seal seat formed within a box member, co-acting inner step threads formed by said box member and said pin member axially adjacent to said metal seal seats, and co-acting outer step threads of larger diameter than said inner step threads formed by said box member and said pin member axially adjacent to said inner step threads, the improvement comprising in combination:

(a) a radial box torque shoulder formed in said box member and having an outside diameter the same as the inside diameter of the outer female step threads and of internal

diameter the same as the outside diameter of the male inner step threads;

(b) a radial pin torque shoulder formed on said pin member and having an outside diameter the same as the inside diameter of the female outer step female threads and of inside diameter the same as the outside diameter of the male inner step threads;

(c) a seal ring groove defined into the outside diameter of said pin member as a radial continuation of said pin torque shoulder between said male upper step threads and said male lower step threads;

(d) a counterbore defined within said box member to extend axially from the internal diameter of said said box torque shoulder for a distance sufficient to enclose said seal ring groove is a cavity defined by said counterbore, torque shoulders and groove when said pin torque shoulder and said box torque shoulder are brought into abutment;

(e) said seal ring as confined being adapted to be readily moved into sealing relation across the juncture of said box torque shoulder and said pin torque shoulder; in response to fluid pressure application and

(f) said seal ring being substantially free of pinches or cuts as said counterbore is moved across said groove to form said cavity.

4,577,896

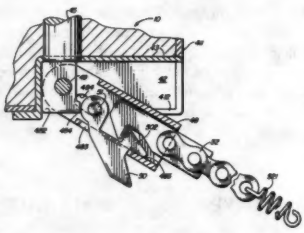
STRIKE PLATE AND SECURITY CHAIN LATCH

Alois Crepinsek, 97 N. Arizona Pl., Chandler, Ariz. 85224

Filed Aug. 26, 1982, Ser. No. 411,687

Int. Cl.[4] E05C *17/36*

U.S. Cl. 292—264 **21 Claims**



1. In combination with a door frame having at least two orthogonal surfaces an improved lock strike plate and security chain latch comprising:

strike plate means having at least two orthogonal faces mating with two complementary with two complementary orthogonal surfaces of said door frame;

security chain latch means recessed within a first one of said two orthogonal faces of said strike plate means and being further recessed within one of said at least two orthogonal surfaces of said door frame when said strike plate face is so mated with said door frame surface,

wherein said first one of said two orthogonal faces of said strike plate means comprises a recess for receiving said security chain latch means;

rotary coupling means for rotatingly coupling said security chain lath means within said recess; and

orthogonal coupling means matingly coupled within said door frame for coupling said at least two orthogonal faces of said strike plate means to two complementary orthogonal surfaces of said door frame,

wherein said orthogonal coupling means comprises first reinforcing means coupled to the interior of said door frame through a first one of said at least two orthogonal surfaces of said door frame, said orthogonal coupling means further comprises a second reinforcing means coupled to the interior of said door frame through a second one of said at least two orthogonal surfaces of said door frame, first reinforcing means further comprises means for matingly coupling with said second reinforcing means within the interior of said door frame.

4,577,897

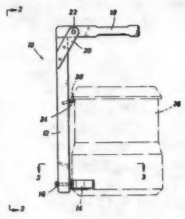
LIFTING TOOL

Joe O. Mazac, 1409 Kathy, Sealy, Tex. 77474

Filed Oct. 7, 1983, Ser. No. 540,151

Int. Cl.[4] B65G *7/12*

U.S. Cl. 294—15 **12 Claims**



1. A manipulating tool for carrying loads, comprising:

a. body means;

b. support means mounted on said body means for preventing rotational movement of such a load;

c. handle means pivotally mounted on said body means remote from said support means and movable relative to said body means between a collapsed configuration relative to said body means and an extended configuration wherein said handle means may be maintained rigid against said body means as said tool is supported by said handle means; and

d. latch means carried by said body means between said handle means and said support means for engaging a load generally above said support means and applying lifting force thereto whereby said load may be carried with said handle means generally extending over said load.

4,577,898

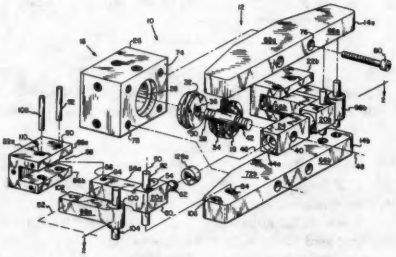
GRIPPER APPARATUS

Kay T. Nusbaumer, Fort Wayne, and Bruce D. McIntosh, Monroeville, both of Ind., assignors to PHD, Inc., Fort Wayne, Ind.

Filed Jun. 12, 1984, Ser. No. 619,819

Int. Cl.[4] B25B *1/00*

U.S. Cl. 294—88 **16 Claims**



1. A gripping apparatus which comprises:

a supporting body;

a first jaw lever pivotally attached to said supporting body and having a remote end that is distal from said pivotal attachment thereof;

means carried by said supporting body for actuating said remote end of said jaw lever arcuately about said pivotal attachment thereof said actuating means including an actuator movable in a straight line;

jaw pad means attached to said supporting body for performing a gripping operation as said remote end of said jaw lever is moved arcuately by said actuating means, said first jaw pad being pivotally attached to the remote end of said jaw lever; and

parallel link means, comprising a link that is parallel to said first jaw lever and pivotally attached to said first jaw pad distal from said pivotal attachment of said jaw lever thereto, and that is pivotally attached to said supporting body distal from said pivotal attachment of said jaw lever thereto, for arcuately positioning said first jaw pad around said pivotal attachment of said jaw lever with said supporting body, and for achieving parallel movement of said first jaw pad as said jaw lever is moved arcuately.

4,577,899

LINER CUP REMOVER

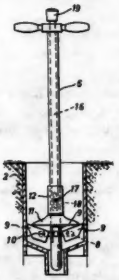
James K. Hemingway, Berkhamsted, England, assignor to H. Pattison & Company Ltd., Middlesex, England

Filed Aug. 8, 1984, Ser. No. 638,692

Claims priority, application United Kingdom, Sep. 9, 1983, 8324183

Int. Cl.⁴ B66C *1/00*

U.S. Cl. 294—95 **10 Claims**



1. A tool for removing the liner cup from a golf hole comprising:

a straight elongate shaft;

a sleeve slidable longitudinally on said shaft;

at least two like members extending generally radially outwards from near one end of the said shaft;

a pivot axis for each member located in each case at right angles to the shaft and at right angles to the general radial orientation of the said member;

an outer edge on each said member, capable of frictional engagement with an inner surface of said liner cup;

the said members being freely pivotable about their respective pivot axes between (a) positions in which their outer edges are located at distances greater than the standard radius of a golf hole from the elongate shaft longitudinal axis and (b) positions in which their outer edges are located at distances less than the said standard radius from the said longitudinal axis;

a handle at the end of said shaft remote from the generally radial members, said handle extending transversely to each side of the shaft;

laterally extending pressure exerting means attached to one end of said sleeve; and means permitting selective positioning of said sleeve in relation to said shaft between a first position remote from the radially extending pivotable members, whereby said members can pivot freely towards the shaft and a second position with the pressure exerting means contacting and immobilizing said radially extending pivotable members, whereby they are positively held with their outer edges frictionally engaging the inner surface of the liner cup; said means permitting selective positioning of said sleeve comprising:

a elongate hollow extending from the top of the said shaft at least to the sleeve, said shaft being formed with radially aligned longitudinal slots in the walls beneath said sleeve;

a rod extending movably along said hollow shaft;

transverse pins extending diametrically from said rod to protrude through each said slot for attachment to said sleeve, whereby said sleeve is capable of movement to an extent defined by abutment of said pins with the ends of said slots;

said rod protruding longitudinally from the upper end of said shaft centrally of said handle;

whereby thumb pressure can be exerted on the protruding end of said rod, as the handle is pulled, to force the sleeve downwardly and bring the pressure-exerting means into immobilizing contact with the pivoted members.

4,577,900

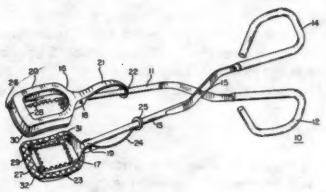
SELF ADJUSTING TONGS

Lee R. Chasen, Port Chester, N.Y., assignor to Coats & Clark, Inc., Stamford, Conn.

Filed Apr. 8, 1985, Ser. No. 720,579

Int. Cl.⁴ B25B *5/04*

U.S. Cl. 294—118 **4 Claims**



1. A pair of self-adjusting tongs, comprising:

a first stem having a first handle at one end;

a first jaw pivotally mounted to the other end of the first stem, for rotation about a first axis transverse to the first stem,

said first jaw having an annular grasping portion and an arcuate spring portion extending from said first axis in the direction of said first handle, said spring portion terminating in a loop surrounding and slidably movable along said first stem;

a second stem pivotally mounted to said first stem and having a second handle at one end adjacent the handle of the first stem;

a second jaw pivotally mounted to the other end of the second stem, for rotation about a second axis transverse to the second stem,

said second jaw having an annular grasping portion and an arcuate spring portion extending from said second axis in the direction of said second handle, said spring portion terminating in a loop surrounding and slidably movable along said second stem;

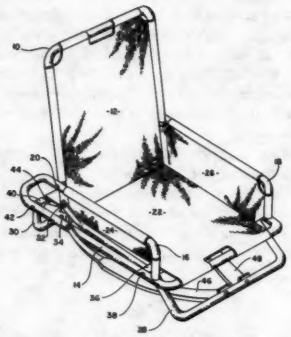
the spring portions of said first and second jaws interacting with said first and second stems respectively to urge the annular grasping portions of said jaws to rotate about said first and second respective axes through a limited angular range toward each other, while permitting pivoting of said first and second jaws about said first and second axes respectively to enable said jaws to orient themselves in conformity with an object engaged between the jaws when the handles are moved toward each other.

4,577,901

CONVERTIBLE UTILITY CHAIR

Mark R. Phillips, 65 Montsalas Dr., Monterey, Calif. 93940

Filed Apr. 30, 1985, Ser. No. 729,120
Int. Cl.[4] A47C 4/00
U.S. Cl. 297—17 6 Claims



1. A chair that is convertible into a carry-all comprising, in combination:

(a) a tubular, substantially U-shaped back frame;

(b) a back panel, said panel being supported by said back frame;

(c) a tubular seat frame having a substantially U-shape and including portions spaced from said generally U-shape defining armrests, said last-named frame being pivotally jointed to said back frame;

(d) a seat panel, said panel being supported by said seat frame;

(e) arm panels, said panels being supported by said seat frame;

(f) a tubular front leg base frame having a generally U-shape, said last-named frame being pivotally joined to said back frame; and

(g) a tubular rear leg base frame having a generally U-shape, said last-named frame being pivotally joined to said back frame.

4,577,902

ROCKER RECLINER AND AWAY-FROM-THE-WALL RECLINER CHAIRS

Michael A. Crum, LaGrange, Ky., assignor to Leggett & Platt, Incorporated, Carthage, Mo.

Filed Feb. 8, 1983, Ser. No. 464,874
Int. Cl.[4] A47C 1/02
U.S. Cl. 297—85 20 Claims

1. A three position rocker recliner chair mechanism comprising,

a fixed base,

a rocker cam movably mounted upon the fixed base,

a rocker base plate fixedly mounted upon the rocker cam,

a carrier plate, the front of said carrier plate being pivotally connected to said rocker base plate,

rear linkage means connecting the rear of said carrier plate to said rocker base plate, said rear linkage means permitting the rear of said carrier plate to move downwardly relative to said rocker base plate as the front of said carrier plate pivots about the front of said rocker base plate,

a seat support plate,

a backrest support plate mounted for pivotal movement relative to said seat support plate,

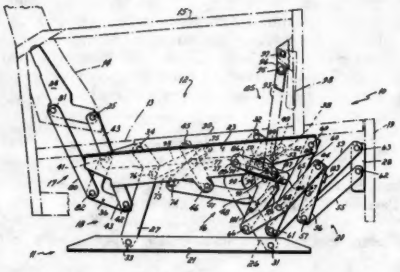
recliner linkage means supporting the seat support plate from said carrier plate, the rear of said seat support plate being movable downwardly with the rear of said carrier plate as the mechanism moves from an upright position to a TV position in response to the weight of a person in the chair,

releaseable locking means for preventing movement of said seat support plate from said upright to said TV position,

release means for releasing said locking means to allow movement of said seat from said upright to said TV position,

a footrest,

footrest linkage means mounted to the seat for moving the footrest between a retracted position adjacent the seat and



an extended position projected forwardly of the seat in response to movement of the seat from said upright to said TV position, and

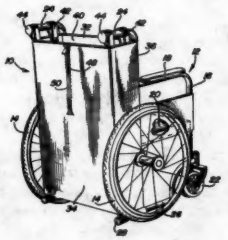
backrest linkage means cooperable with said recliner linkage means to effect forward and upward movement of said seat support plate relative to said carrier plate while said carrier plate remains in a fixed position relative to said rocker base plate as said rocker recliner chair mechanism moves from the TV to the full recline position in response to pivotal movement of said backrest support plate relative to said seat support plate.

4,577,903

WHEELCHAIR ATTACHED STORAGE BAG

Carol L. Wells, 1897 Citrus Hill Rd., Palm Harbor, Fla. 33563

Filed Apr. 2, 1984, Ser. No. 595,964
Int. Cl.[4] A47C 7/62
U.S. Cl. 297—188 5 Claims



1. In combination with a wheelchair having a seat for an occupant, a frame with rearwardly extending tip bars at the rear lower ends thereof and a pair of handles at the upper ends thereof, a pair of large wheels supporting said wheelchair, a vertically disposed flexible storage bag oriented rearwardly of the seat, between the rearward portions of the wheels and between the handles and tip bars, said bag including a peripheral wall, means on said bag detachably engaged with said handles and tip bars, and means incorporated into said bag enabling access into the interior thereof, said means on the bag engaging the handles including loops at laterally outer edges of

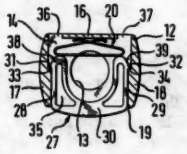
the top of the bag, said means engaging the tip bars including a pair of sleeves at the laterally outer edges of the bottom of the bag to support the bag taut between the handles and tip bars and inwardly of the wheels, said bag being generally of rectangular configuration with a front-to-rear dimension confining the bag to the area between the rear portions of the wheels to eliminate interference with operation of the wheelchair and enabling the bag to fold with the wheelchair when used in combination with a folding wheelchair.

4,577,904

GUIDING SLEEVE FOR HEAD RESTS AT VEHICLE SEATS

Heiner Wiese, Hamburg, and Rainer Gramss, Norderstedt, both of Fed. Rep. of Germany, assignors to ITW Ateco GmbH, Norderstedt, Fed. Rep. of Germany

Filed Jan. 30, 1984, Ser. No. 574,830
Int. Cl.⁴ A47C 7/36
U.S. Cl. 297—410 **5 Claims**



1. An improved adjustable guiding sleeve wherein the improvement comprises:

a hollow elongated sleeve;

a flange integral with said sleeve at one end thereof having an aperture co-axial with the bore of said sleeve and having a narrow rectangular slot extending through said flange, perpendicular to the longitudinal axis of said sleeve and across the aperture of said sleeve said slot being defined by a pair of oppositely facing side walls, top and bottom walls, an end wall and a narrow rectangular opening opposite said end wall;

a spring biasing member within said slot having a normal and a depressed position and being formed of a resilient elongated base member conforming to the shape of said slot and having a rearwardly bent leg on each of its ends which extend a predetermined distance from said base so that when in its normal position crosses said aperture of said flange a predetermined distance to frictionally engage a member within said sleeve and when in its depressed position no longer crosses said aperture; and

an actuating means for compressing said biasing member against said end wall to move it from said normal to said depressed position.

4,577,905

VEHICLE ARMREST

Robert J. Grant, 7846 Normile, Dearborn, Mich. 48126

Filed Jul. 7, 1983, Ser. No. 511,463
Int. Cl.⁴ A47C 7/54
U.S. Cl. 297—411 **7 Claims**

1. For use in conjunction with a vehicle having a seat mounted on a floor of the vehicle and said floor having a transmission hump which protrudes upwardly from the floor and has two sides, an armrest assembly comprising:

a base having an upper end, a lower end, and two side panels, said side panels having tail sections which extend downwardly along the sides of the transmission hump,

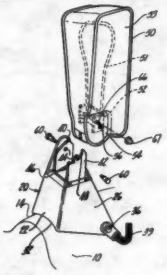
means for securing said tail sections of said base side panels to the transmission hump so that said upper end of said base is spaced upwardly from the transmission hump,

an elongated cushion,

means for pivotally mounting one end of said cushion to said upper end of said base;

wherein said pivotal mounting means comprises a pair of spaced plates secured to the top end of said base, said one end of said cushion positioned in between said plates, and said pivotal mounting means extending between said plates and said cushion;

means for limiting the pivotal position of said cushion in one



direction so that a surface of said cushion lies in substantially a horizontal plane, said limitng means comprising a pin secured to said one end of said cushion and a notch formed in one of said plates, said pin nesting in said notch when said cushion is in said limited position; and

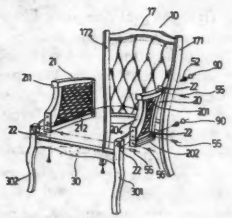
wherein said limiting means and said pivotal mounting means together comprise the sole means for supporting said cushion so that said surface lies in said horizontal plane.

4,577,906

ARMCHAIR WITH KNOCKED DOWN FRONT LEGS

Shu-Jen Hsiung, No. 549, Hsin-Shu Rd., Hsin-Chuang, Taipei Hsien, Taiwan

Filed Jun. 29, 1984, Ser. No. 626,375
Int. Cl.⁴ A47C 7/00
U.S. Cl. 297—440 **1 Claim**



1. An armchair including a back having a pair of upright rear legs each being formed with a forward-facing flat mounting surface, a pair of armrests each being formed at its front and rear ends with respective forward-facing and rearward-facing flat mounting surfaces, a front leg frame having a pair of upright front legs each being formed with a rearward-facing mounting surface, fastener means for assembling said back, said pair of armrests and said front leg frame together as an armchair with the facing flat mounting surfaces of the back, armrests and front leg frame in abutting relationship to form respective joints, said fastener means further providing for disassembly of said back, said pair of armrests and said front leg frame in a knocked-down manner, said fastener means including a bolt member and a cylindrical member for each joint, each bolt member having a head at one end and a screw thread at the other end, means forming a first threaded hole in each

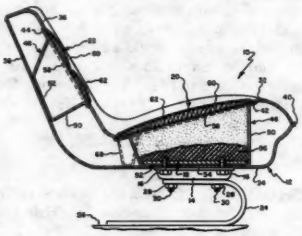
cylindrical member for receiving the screw thread of the bolt member, means forming a second hole in each cylindrical member extending perpendicular to the longitudinal axis of the first hole, means forming cavities in the flat mounting surfaces of the back, armrests and front leg frame, each cavity being sized to seat a respective cylindrical member, and locking pin means for insertion into the second holes of each cylindrical member for locking such cylindrical member in the respective cavity.

4,577,907

SEAT ASSEMBLY

Floyd H. Talmon, Fairview Park, Ohio, and David K. Talmon, Williamsville, N.Y., assignors to Air-Lock Plastics, Inc., Tonawanda, N.Y.

Filed Oct. 19, 1984, Ser. No. 662,501
Int. Cl.[4] A47C *7/02*
U.S. Cl. 297—452 **7 Claims**



1. A seat assembly comprising:

a support;

a generally rigid integral one piece blow molded seat construction having bottom and back portions, the bottom portion having a bottom cushion receiving surface and an opposed surface, and the back portion having a back cushion receiving surface and an opposed surface, each of said cushion receiving surfaces being provided with a recessed area, the recessed area in the bottom portion being provided with a pair of spaced apart reinforcing wells, each well having spaced apart sidewalls and an interconnecting well bottom wall which is bonded to the corresponding opposed surface, said reinforcing wells maintaining the bottom cushion receiving surface at a substantially fixed distance from the corresponding opposed surface;

bottom and back cushions received within the recessed areas of said bottom and back cushion receiving surfaces, each of said cushions including a backing, a covering, and resilient foam disposed between said backing and said covering, the backing and the recessed area of the associated cushion receiving surface being in juxtaposition;

a pair of mounting plates received within the pair of reinforcing wells in the bottom portion, one surface of each of said mounting plates and a corresponding well bottom wall being in juxtaposition; and

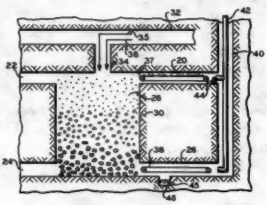
fastening means extending through said support, said opposed surface of the bottom portion, a well bottom wall and an associated mounting plate to secure said blow molded seat construction to said support.

4,577,908

METHOD FOR IN SITU SHALE OIL RECOVERY

Joseph M. McKee, Bartlesville, Okla., and Robert L. Horton, South Russell, Ohio, assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 19, 1984, Ser. No. 652,024
Int. Cl.[4] C10B *53/06*; E21C *41/10*
U.S. Cl. 299—2 **7 Claims**



1. A method of in situ processing of oil shale in a subterranean formation comprising the steps of:

rubblizing a section of oil shale in the subterranean formation, wherein the section has boundaries which form a retort chamber having a top end and a bottom end;

removing the rubblized shale from the retort chamber;

crushing the rubblized shale so as to produce shale particles of various sizes within a certain overall size range;

separating the shale particles according to size into a plurality of shale particle groups, wherein each group includes shale particles within a predetermined group size range, and wherein each group size range makes up a portion of the overall size range;

sequentially reloading substantially all of the shale particle groups into the retort chamber so that the shale particle groups are graded according to particle size within the chamber, wherein the largest shale particles are at the bottom end of the retort chamber and the smallest shale particles are at the top end of the retort chamber, the particles being evenly distributed throughout the retort chamber during reloading;

retorting the reloaded shale particles such that liquid hydrocarbon products are produced;

removing the liquid hydrocarbon products from the retort chamber.

4,577,909

WHEEL COVER CENTER RETENTION SYSTEM

James E. Browning, Adel, Ga., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Feb. 2, 1983, Ser. No. 463,069
Int. Cl.[4] B60B *7/00*
U.S. Cl. 301—37 TP **8 Claims**

1. A center retention system for retaining a wheel cover on a vehicle wheel of the type having a plurality of slots disposed along a radially inward circle of the wheel, said system comprising:

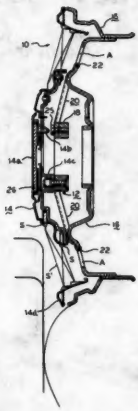
a center piece disposed about the axis of said wheel;

a plurality of radially extending straps, each strap having an inner end fastened to said center piece and an outer end for engaging the radially inward wall of a respective one of said slots thereby to limit the radially inward movement of said strap;

means for removably fastening said wheel cover to said center piece; and,

wherein said straps are provided with a generally U-shaped cross section at least along a portion thereof which en-

gages said center piece and wherein the engaging portions of said center piece are provided with corresponding slots



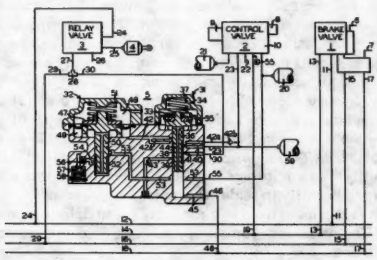
for receiving the legs of the U-shaped portions of said straps.

4,577,910

QUICK RELEASE VALVE ARRANGEMENT

Robert J. Worbois, North Huntingdon, Pa., assignor to American Standard Inc., Wilmerding, Pa.

Filed May 4, 1984, Ser. No. 607,061
Int. Cl.[4] B60T *15/32*
U.S. Cl. 303—69 **13 Claims**



1. For use in a locomotive having an automatic and an independent brake system including a brake pipe, an auxiliary reservoir charged to the pressure carried in said brake pipe, an actuating pipe, a brake valve device having an automatic brake valve handle to vary the pressure of fluid carried in said brake pipe and an independent brake valve handle to pressurize and depressurize said actuating pipe, braking means, and a control valve device operative in response to a pressure differential between said brake pipe and said auxiliary reservoir in a first sense to connect said auxiliary reservoir pressure to a brake cylinder pipe connected to said braking means to effect operation of said braking means and operative in response to a pressure differential between said brake pipe and said auxiliary reservoir in a sense opposite said first sense to exhaust said brake cylinder pipe, there is provided quick release valve means for effecting the release of a brake pressure applied through said independent brake system application without releasing brake pressure applied through said automatic brake system comprising:

(a) first valve means for interrupting fluid pressure communication between said control valve and said braking means via said brake cylinder pipe and for concurrently exhausting fluid pressure from said braking means when said actuating pipe is pressurized; and

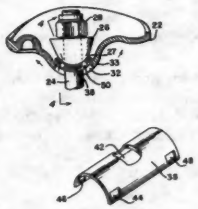
(b) second valve means for exhausting said auxiliary reservoir pressure when said actuating pipe is pressurized until the auxiliary reservoir pressure is such as to establish said pressure differential in said opposite sense.

4,577,911

OSCILLATING BEARING

Arnold E. Fredericksen, Colebrook, and Robert D. Richtmeyer, Goshen, both of Conn., assignors to The Torrington Company, Torrington, Conn.

Filed Sep. 26, 1985, Ser. No. 780,281
Int. Cl.[4] F16C *11/00*
U.S. Cl. 308—2 R **2 Claims**



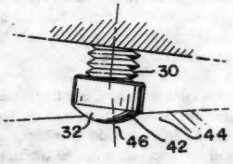
1. An oscillating bearing comprising: arcuate inner raceway means; arcuate outer raceway means; and an arcuate retainer between said inner raceway means and said outer raceway means, the inner raceway means, the outer raceway means and the retainer having aligned openings for receiving a stud, said retainer having two pairs of arcuate roller pockets, one pair of pockets being axially spaced from the retainer opening in one direction, the other pair of pockets being axially spaced from the retainer opening in the other direction, one pocket of each pair being spaced in the oscillating direction on the opposite side of the retainer opening from the other pocket; and a single roller in each pocket.

4,577,912

SELF-ALIGNING LOAD TRANSMISSION POST

Robert F. Snyder, Hamden, Conn., assignor to Raymond Engineering Inc., Middletown, Conn.

Filed Apr. 26, 1984, Ser. No. 604,171
Int. Cl.[4] F16C *11/00*
U.S. Cl. 308—2 R **8 Claims**



1. A self-aligning post for transmitting a load to a bellows including:

a cylindrical body portion having a planar end surface substantially perpendicular to the axis of said cylindrical body portion;

a semispherical tip, said tip having a flat surface perpendicular to the central axis of said tip and in contact with said planar surface of said cylindrical body portion, said tip also having a spherical shaped surface for engagement with a concave receptacle of the bellows, the radius of curvature of said

spherical surface being less than the radius of the concave receptacle, whereby said spherical shaped surface of said tip is always in contact with the same part of the concave receptacle of the bellows when imposing a load, regardless of the alignment of said cylindrical body portion with respect to the bellows; and

means for retaining said cylindrical body portion in contact with said semispherical tip, said retaining means comprising an annular skirt disposed along the perimeter of said flat surface of said tip, and wherein said cylindrical body portion is removably disposed within said annular skirt.

4,577,913

WRAPAROUND SUPPORT FOR A LINEARLY GUIDED SLIDE

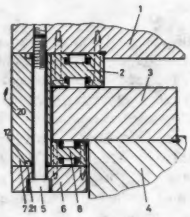
Andrezej Metelski, Romanshorn, Switzerland, assignor to Hydrel AG, Romanshorn, Switzerland

Filed Jun. 7, 1984, Ser. No. 618,172

Claims priority, application Switzerland, Jun. 10, 1983, 3212/83

Int. Cl.⁴ F16C *29/04*

U.S. Cl. 308—6 R **10 Claims**



1. A wraparound support for guiding an elongated slide along a stationary guide bar having a top face, a bottom face and a side face joining the top and bottom faces, comprising:

an upper guide member mounted to the bottom of the slide and having bearing means on the bottom side thereof for sliding along the top face of the guide bar;

an intermediate support member mounted to the bottom of the slide and adjacent to the upper guide member and positioned adjacent to the side face of the guide bar;

a lower guide member including bearing means on the upper surface thereof for sliding along the bottom face of the guide bar secured to the intermediate support member; and

at least two tension screws mounted through the intermediate support member for applying tensional force between the upper and lower guide members;

the intermediate support member including a support portion and a spacer portion, the support portion being spaced apart from the side face for firmly coupling the lower guide member and the slide, the spacer portion being adjacent to side face and having openings therethrough adapted to receive the tension screws, the spacer portion defining an adjustable distance between the lower guide member and the slide where the tension screws pass from the lower guide member through the respective openings in the spacer portion of the intermediate support member, the adjustable distance being less than the distance between the lower guide member and the slide at the support portion of the intermediate member.

4,577,914

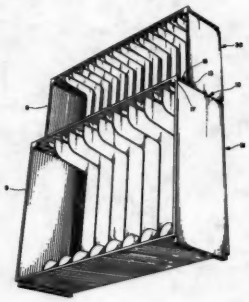
ASSEMBLY OF SLIDABLY INTERFITTING STORAGE UNITS

David M. Stravitz, 16 Park Ave., Suite 14 A, New York, N.Y. 10016

Filed May 16, 1984, Ser. No. 610,699

Int. Cl.⁴ A47B *87/02*

U.S. Cl. 312—10 **6 Claims**



1. A storage unit for interfitting with at least one like storage unit to form an assembly of said storage units, each of said storage units comprising:

a top section (2), a rear section (7), a pair of side sections (6) and a bottom section (5), said sections being integrally connected to form a box-shape storage unit having a front edge defining an open front end for receiving items to be stored, opposed ends of said side sections being integrally connected to opposed ends of said top and bottom sections, respectively to define four corners of the box shaped unit;

a pair of generally L-shaped projections (10) located at opposed ends of said top section (2) at upper corners defined by said side sections (6) and said top section (2), said L-shaped projections (10) being integrally connected to said side sections (6) and having first arms (11) extending upward therefrom above said top section (2) and extending over substantially the complete length of said opposed ends of said top section (2), each of said L-shaped projections (10) having a second arm (12) extending inwardly of said storage unit and connected substantially perpendicularly to said first arm (11) at an end of said first arm (11) remote from said top section and defining a space (41) between said top section (2) and said second arms (12); and

a pair of projection receiving channels (15) located at opposed ends of said bottom section (5) at lower corners defined by said side sections (6) and said bottom section (5), said projection receiving channels (15) being integrally formed at said lower corners and recessed within the confines of said lower corners, said projection receiving channels (15) each having an L-shaped recess (19) opening from the side of the storage unit and extending in a direction toward the interior of the storage unit, for receiving therein an L-shaped projection (10) of another like storage unit, each of said projection receiving channels comprising first and second walls (21, 20; FIG. 8) defining said L-shaped recess (19), said first wall (21) being coextensive with said bottom section (5) and terminating short of said side section (6) so as to be recessed inwardly of said side sections, and said second wall (20) being substantially parallel to said bottom section (5) and extending inwardly from said side section (6) above said first wall to define a space with said first wall to receive a second arm (12) of an L-shaped projection, the thickness of said first wall (21) corresponding to the height of said space (41), said projection receiving channels (15) each

having an open end (16) at the rear of said storage unit for slideably receiving said L-shaped projection (10), and a closed end (17) at the front of said storage unit for preventing further movement of said L-shaped projection (10) in said projection receiving channels (15), said closed end defining a plate-like member flush with the front of said storage unit for covering said L-shaped recess, said projection (10) having at least one end (13) which terminates a given distance from a front edge of said top section to accommodate said closed end (17), whereby a projection (10) of said another storage unit is removably slideable into said projection receiving channels in interfitting engagement to connect two like storage units together to form an assembly, said assembly having substantially flat sides even at the connection area therebetween and said top section of a storage unit is in substantial contact with a bottom section of said another storage unit.

4,577,915

REFRIGERATOR CABINET

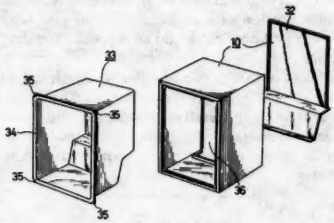
Susumu Nishida, Katano; Seiji Kimura, Yao; Akio Kobayashi, and Tadashi Fuchigami, both of Hirakata, all of Japan, assignors to Sanyo Electric Co., Ltd., Japan

Filed Jun. 13, 1983, Ser. No. 503,848

Claims priority, application Japan, Jun. 15, 1982, 57-103159; Apr. 20, 1983, 58-70297

Int. Cl.⁴ E65D *25/14*

U.S. Cl. 312—214 **10 Claims**



1. An improved refrigerator cabinet of the type wherein an inner enclosure is mounted inside an outer housing, said outer housing comprising:

a top wall and side walls integrally formed from a single bent metal sheet;

a top front flange connected to said top wall along a front edge of said top wall, said flange being bent inwardly and substantially perpendicularly to said top wall; and

side front flanges connected to said side walls along front edges of said side walls, respectively, said flanges being bent inwardly and substantially perpendicularly to said side walls, said top front flange being substantially adjacent to said side front flanges at upper corners of said outer housing;

turnover flange portions, each connected to a respective front flange, each said turnover flange portion being bent substantially behind said respective front flange;

rear-bent flange portions, each connected to a respective turnover flange portion, bent rearwardly so as to extend rearwardly from said turnover flange portions and substantially parallel to said respective top and side walls;

each rear-bent flange portion having a free edge portion, said free edge portions being bent inwardly so as to be substantially parallel and in spaced relationship to said turnover flange portion so as to define therebetween a space for receiving an outer front fringe extending around the front periphery of said inner enclosure when said inner enclosure is mounted in said outer housing;

one of said front flanges at an upper corner partially overlapping its adjacent front flange, said overlapping flange further comprising:

a corner rear-bent portion bent substantially behind said overlapping front flange along a reference line inclined at a predetermined angle with respect to horizontal, said line extending from said corner inwardly in substantially the plane of said front flange, said corner rear-bent portion leaving a predetermined space between said corner rear-bent portion and said front flange;

said overlapped front flange adjacent to said overlapping front flange further comprising:

a stepped portion connected to said overlapped front flange substantially along said reference line, said stepped portion extending from said overlapped front flange substantially parallel to and behind said overlapping front flange, said stepped portion extending across and substantially obstructing a gap between said overlapping and overlapped front flanges at said upper corner, said gap extending between said flanges along said inclined reference line, and further so as to maintain said front flanges substantially flush with one another.

4,577,916

FURNITURE FASTENER ASSEMBLY

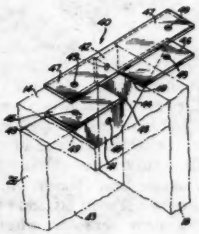
Emile Seigneur, 72 Avenue Herbillon, 94160 Saint Maude, and Philippe Paillart, 13, Rue Mercerie, 05100 Briancon, both of France

Filed Jan. 18, 1984, Ser. No. 571,844

Claims priority, application France, Jan. 25, 1983, 83 01055

Int. Cl.⁴ F16B *12/00*

U.S. Cl. 312—257 R **8 Claims**



1. A fastener assembly for fastening together parts of furniture, comprising in combination:

A. a front corner fastener means comprising a rectangular web, a first rectangular means flange integrally attached at a right angle along one entire side of the web; a second rectangular flange integrally attached at a right angle along only a part of the other side of the web; a first end of the second flange beginning at one end of the web and the other end of the second flange terminating before the other end of the web; the web and flanges having a U-shaped cross-section, the distance between the other end of the second flange and the other end of the web defining a cut-out portion and having a size sufficient to cover the thickness of a board abutting the web at that other end; an aperture in that other end of the web to receive a screw to fasten the web to a first board at one corner thereof; an aperture in the first flange to receive a screw to fasten a second board to it; the end of the second board abutting the side of the first board; and

B. a rear corner fastener means comprising a rectangular web, triangular portion integrally attached to the web in the same plane as the web beginning at one end of the web and terminating before the other end of the web; the triangular portion having a leg extending at a right angle away from the web; a first rectangular flange integrally attached to the leg at a right angle to it; a second rectangular flange integrally attached to the other end of the web at a right angle to it and extending in the same direction as the first rectangular flange; the web having an aperture at

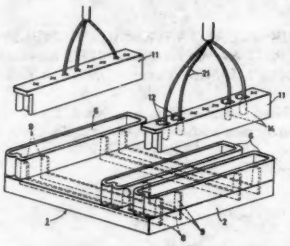
each end to receive screws to fasten it to the first board along its inner face and abutting the second rectangular flange; and an aperture in each of the first and second rectangular flanges to receive screws to fasten them to the second board passing between them and abutting the side of the first board.

4,577,917

COUPLER CONNECTING DEVICE

Ryo Nashimoto, Tokyo, and Shoji Motodate, Saitama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 452,007, Dec. 21, 1982, abandoned. This application Mar. 6, 1985, Ser. No. 709,350
Claims priority, application Japan, Dec. 25, 1981, 56-209030
Int. Cl.[4] H01R *9/28, 13/50, 13/64*
U.S. Cl. 339—150 T **4 Claims**



1. In a two wheeled vehicle, a device for selectively connecting electrical elements of said two wheeled vehicle to a power source of said two wheeled vehicle, said device comprising power source wires, one end of said power source wires being connected to said power source, electrical element wires, one end of said electrical element wires being selectively connected to said electrical elements, and a terminal holder (1) interposed between said power source wires and said electrical element wires for connecting the other ends of said power source wires to the other ends of said electrical element wires, said terminal holder (1) comprising:

a substrate (2) having at least a length and a width;

a plurality of linear metal terminal plates (8), each of said plates having a length, width and depth, said length and width of each terminal plate defining a rectangular shape, said plurality of terminal plates being arranged in said substrate at predetermined intervals across substantially the entire widthwise direction of said substrate and in parallel with one another, the lengths of all of said plates parallel to the length of said substrate extending across the entire length of said substrate;

a plurality of terminals (9) attached to the depth portion of each of said terminal plates; and

a plurality of coupler fitting parts (6) for receiving couplers (11), said coupler fitting parts (6) being arranged perpendicular to the longitudinal direction of said terminal plates (8) and parallel to one another, each of said terminal plates (8) extending, without interruption, across all of said plurality of coupler fitting parts;

said coupler fitting parts (6) having a commonly shaped inner surface and one key grooved side in the widthwise direction for preventing incorrect mating of a coupler fitting part with a coupler, there being contained within each of said coupler fitting parts a predetermined number of said terminals (9);

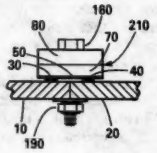
whereby a coupler can be mated with any of the coupler fitting parts and the same electrical interconnection will result.

4,577,918

COPPER AND DUAL DUROMETER RUBBER MULTIPLE CONNECTOR

Dino G. Kasdagly, Rome, Pa., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 1, 1984, Ser. No. 606,086
Int. Cl.[4] H01R *9/09*
U.S. Cl. 339—17 M **7 Claims**



1. A device for electrically connecting two spaced apart lands comprising:

(a) a relatively rigid member;

(b) a compressible member operatively connected to said relatively rigid member along a bond line therebetween, said compressible member having a cavity for receiving a wire;

(c) an electrically conductive wire having an irregularly shaped cross-section having an acute protuberance shaped thereon, said protuberance being operatively connected to at least a portion of said bond line and said wire being seated in a first portion in said cavity and extending therefrom; and

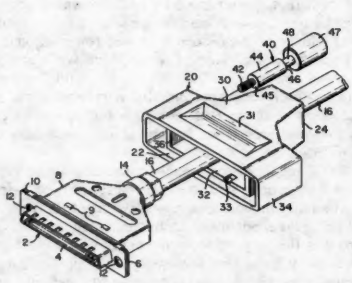
(d) two lands adjacent one another and adapted to move relative to said wire so that when said relatively rigid member is forced generally towards said lands, said wire is pivoted into contact with both of said lands in a wiping action to form an electrically conductive connection therebetween.

4,577,919

BOOT AND SHIELDED CABLE CONNECTOR

Mark H. Waters, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 19, 1985, Ser. No. 703,020
Int. Cl.[4] H01R *13/621*
U.S. Cl. 339—59 M **3 Claims**



1. An elastomeric boot assembly combination with a cable and a cable connector of the type having a mating face and an opposed cable receiving face, the boot assembly comprising a boot having an open connector receiving end and an opposed cable receiving end, said boot being received on said connector by sliding over a cable terminated thereto, said cable being received through a cable receiving aperture in said cable receiving end, said mating face remaining exposed through said connector receiving end of said boot, characterized in that:

said boot assembly is adapted for use with a shielded cable

connector of the type having a flange about the periphery of said mating face, said assembly further comprising screw means passing through said cable receiving end of said boot and said flange to retain said connector against a complementary connector, said screw means comprising at least one screw having a threaded end, an opposed head, and an enlarged shank therebetween, said shank having a first shoulder facing said threaded end and a second shoulder facing said head, said second shoulder and said head defining a constricted neck therebetween, said boot having a screw receiving aperture therein which receives said screw therethrough for alignment with a hole in said flange, said screw receiving aperture being sized to closely receive said constricted neck, said aperture being expansible to receive said enlarged shank portion therethrough, whereby

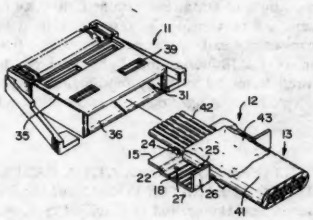
upon assembling said boot to said connector and inserting said screw into said screw receiving aperture so that said threaded end extends through the hole in the flange, the constricted neck will be captured in said screw receiving aperture in said boot, the first shoulder bearing against said flange to draw the connector to a complementary connector as the head is rotated.

4,577,920

ELECTRICAL ASSEMBLY WITH CABLE GUIDING MEMBER

Daniel R. Coldren, Enola, and James Pritulsky, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 15, 1984, Ser. No. 660,626
Int. Cl.[4] H01R *13/46*
U.S. Cl. 339—143 R **13 Claims**



1. An electrical plug assembly comprising an insulated housing having a cable-receiving mouth opening to a rear end of the housing and communicating internally of the housing with a row of conductor-receiving pathways extending to a front end of the housing in alignment with respective terminals, a shield member of conductive material extending around the housing forwardly from the rear end to provide a substantially continuous shield around the mouth;

a one-piece cable guide member of conductive material having front and rear ends between which extends a cable supporting base, cable locators upstanding from the base in spaced apart relation to locate between them an insulated conductor row and cable sheath extending between front and rear ends of the cable guide member and, shielding flanges upstanding from the base to extend along the rear end between opposite side edges of the base and the cable locators;

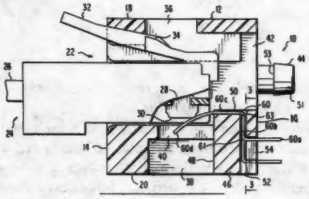
whereby on loading a shielded cable into the guide member with an outer insulation sheath stripped cut back from a front end to expose the row of insulated conductors free of the shield with the cable located between the cable locators, the cable guide member can be inserted, front end leading, into the mouth, drawer fashion, as a sliding fit, guiding the conductors into respective ones of said pathways with the shield flanges completely closing the mouth on each side of the cable and electrically connected to the shield.

4,577,921

MODULAR CONNECTOR WITH IMPROVED HOUSING AND CONTACT STRUCTURE

Stephen B. Bogese, II, Roanoke, Va., assignor to Virginia Patent Development Corp., Roanoke, Va.

Continuation of Ser. No. 326,133, Nov. 30, 1981, Pat. No. 4,501,464, which is a continuation-in-part of Ser. No. 215,054, Dec. 10, 1980, Pat. No. 4,457,570, which is a continuation-in-part of Ser. No. 120,846, Feb. 12, 1980, which is a continuation of Ser. No. 915,457, Jun. 14, 1978, abandoned. This application Aug. 17, 1984, Ser. No. 641,678
Int. Cl.[4] H01R *13/50*
U.S. Cl. 339—176 M **13 Claims**



1. A telephone-type modular jack for interfacing a telephone-type modular plug with a printed circuit board, which comprises:

a housing having a front portion, a front wall, a rear portion and an outer wall, said outer wall including means extending integrally therefrom for mounting said housing to the printed circuit board;

an opening formed through said front wall in said front portion of said housing for receiving the telephone-type modular plug having a multi-conductor cord terminated by a plurality of side-by-side, substantially planar, insulation-piercing, contact terminals positioned in the forward portion of the plug, said opening defined by an inner end wall and inner side walls, a rear partition extending transversely across said rear portion of said housing and including a plurality of side-by-side conductor-receiving means formed therein; and

a plurality of electrical conductors arranged in a side-by-side, spaced-apart fashion in said housing, each of said conductors including an end portion extending normally from said outer wall for insertion through a corresponding hole formed in the printed circuit board, a second intermediate portion positioned in said conductor-receiving means in said rear partition, a first intermediate portion formed between said end portion and said second intermediate portion and extending across said rear portion of said housing, and a spring contact portion extending from said second intermediate portion into said opening from said rear portion of said housing towards said front portion of said housing, said spring contact portion terminating in a free end portion that is closer to said front wall than the rest of said spring contact portion;

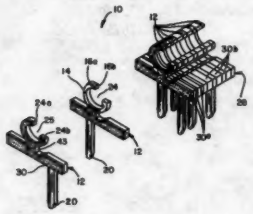
said contact terminals of said telephone-type modular plug engaging said spring contact portions of said conductors upon insertion of said telephone-type modular plug into said opening of said telephone-type modular jack.

4,577,922

LAMINATED ELECTRICAL CONNECTOR ARRANGEMENT

John M. Stipanuk, Glen Ellyn; Alan S. Walse, LaGrange, and Kent E. Regnier, Lombard, all of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Apr. 4, 1985, Ser. No. 719,944
Int. Cl.[4] H01R *13/50, 3/00*
U.S. Cl. 339—176 MP 8 Claims



1. An electrical connector arrangement for mounting to a printed circuit board comprising:

a plurality of generally side-by-side free standing metal terminals adapted to be mounted to said board, each terminal having a body with oppositely facing nesting surfaces, a depending circuit board tail for electrical engagement with said board and means to mate with another electrical member; and

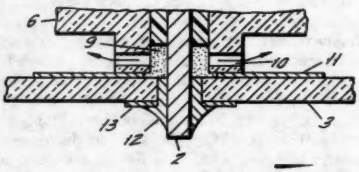
dielectric means being disposed between said terminal bodies in such a manner to insulate the nesting surfaces of adjacent terminals and to form a continuous mutually supported stacked array of terminals when mounted to a printed circuit board.

4,577,923

MICROWAVE INTEGRATED CIRCUIT AND MOUNTING DEVICE THEREFOR

Hiroshi Ikemizu, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Mar. 26, 1984, Ser. No. 593,614
Claims priority, application Japan, Mar. 24, 1983, 58-42241[U]; Mar. 24, 1983, 58-42242[U]
Int. Cl.[4] H01R *4/02*
U.S. Cl. 339—275 B 7 Claims



1. A microwave integrated circuit having at least one lead extending therefrom, said microwave integrated circuit comprising:

a protrusive portion being coaxial with and arranged around said lead that an axially extending space is defined between said lead and an inside surface of said protrusive portion, said protrusive portion being formed of an electrically conductive material; and

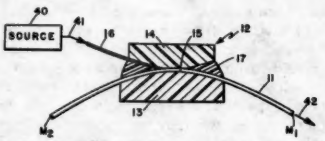
degasifying means extending from said space to an area external of said protrusive portion.

4,577,924

OPTICAL RECURSIVE FILTER

Ronald F. Mathis, San Diego, Calif., assignor to General Dynamics Electronics Division, San Diego, Calif.

Continuation of Ser. No. 384,186, Jun. 3, 1982, abandoned. This application Jan. 2, 1985, Ser. No. 688,271
Int. Cl.[4] G02B *6/26, 6/42*
U.S. Cl. 350—96.15 21 Claims



1. An optical recursive RF bandpass filter for extracting light varying in intensity at a predetermined intensity modulation frequency from light varying in intensity over a band of intensity modulation frequencies, comprising:

a segment of multimode optical fiber;

a first mirror on one end of said fiber;

a second mirror on the other end of said fiber; and

means for directing light varying in intensity over a band of intensity modulation frequencies at a substantially constant optical wavelength into said fiber;

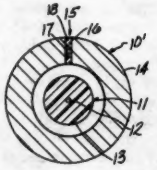
wherein said fiber has a length equal to half the wavelength of a predetermined intensity modulation frequency in said band of intensity modulation frequencies in said fiber, said fiber with said first and second mirrors on opposite ends thereof defining a resonant cavity which permits resonance of light at said predetermined intensity modulation frequency, a portion of the resonating light within said resonant cavity exiting through one of said first and second mirrors as filtered output light varying in intensity at said predetermined intensity modulation frequency with said filtered output light being at said optical wavelength.

4,577,925

OPTICAL FIBER COMMUNICATION CABLES AND METHOD AND APPARATUS FOR ASSEMBLING SAME

Joseph Winter, New Haven, and Michael J. Pryor, Woodbridge, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 408,087, Aug. 13, 1982, abandoned. This application May 24, 1983, Ser. No. 497,533
Int. Cl.[4] G02B *6/44*
U.S. Cl. 350—96.23 34 Claims



1. An improved individually armored fiber optic core assembly having a diameter less than about 0.050" comprising:

a fiber optic element;

a protective layer surrounding said fiber optic element and forming in combination with said fiber optic element a fiber optic core; and

a high strength drawn metal sheath surrounding said fiber optic core, said sheath including a generally longitudinally extending seam, with the ratio of the outside diameter of said fiber optic core to the inside diameter of said sheath comprising at least about 0.6:1, said seam being defined by

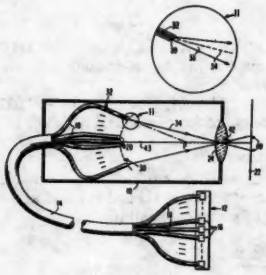
opposing nonlinear deformed sheath edges each of whose length from the outside of said sheath to the inside of said sheath exceeds the thickness of said sheath.

4,577,926

FIBER OPTIC WRITING HEAD

Anthony G. Dewey, and Charles P. Marinelli, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 30, 1983, Ser. No. 537,478
Int. Cl.[4] G02B 6/04
U.S. Cl. 350—96.25 9 Claims



8. An optical system for imaging an array of beams onto a writing surface comprising

a plurality of lasers,

a lens having an entrance pupil with a center,

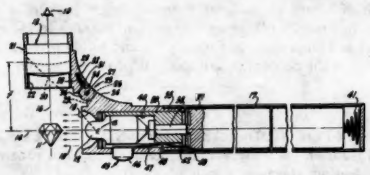
an array of optical fibers into which the light from said lasers is coupled, said fibers having ends which are imaged by said lens onto the writing surface, said ends are positioned along a curved first surface which is the image of the writing surface as produced by said lens, said fibers being positioned at predetermined angles so that the axis of the refracted beam being emitted at each of said ends is directed at the center of said entrance pupil of said lens wherein the image on said writing surface has a constant focus and intensity.

4,577,927

PORTABLE UNITARY BATTERY POWERED HAND-HELD MAGNIFYING APPARATUS

Gerard E. Raney, 1278 Edgewood Rd., Redwood City, Calif. 94062

Filed Mar. 7, 1983, Ser. No. 472,731
Int. Cl.[4] G02B 25/02, 27/04
U.S. Cl. 350—235 9 Claims



1. A portable unitary battery powered hand-held magnifying apparatus where the eye of a viewer may observe a specimen comprising:

a light source having substantially parallel rays centered around a light axis;

a viewing lens having an optical axis perpendicular to said light axis and a focal point substantially at said light axis when in an operating position;

means for holding and retaining said lens;

a tubular battery case for holding battery means to power said light source and also for retaining said light source and including actuating means for energizing said light source;

hinge means for connecting said lens holding means to said battery case for allowing said holding means to be folded down onto said battery case in a stowed position to form an essentially continuous tubular like structure;

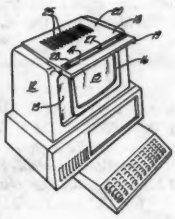
said hinge means, when opened in said operating position, placing said optical axis perpendicular to said light axis, and offsetting said lens from said light source to prevent substantially all direct rays from the light source from entering said lens and the eye of said viewer whereby dark field illumination of said specimen which is placed at the intersection of the focal point of said lens and said light axis is accomplished to illuminate inclusions in said specimen.

4,577,928

CRT MAGNIFYING LENS ATTACHMENT AND GLARE REDUCTION SYSTEM

Eugene C. Brown, Birmingham, Mich., assignor to Data Vu Company, Birmingham, Mich.

Continuation-in-part of Ser. No. 487,309, Apr. 21, 1983, Pat. No. 4,529,268. This application Jul. 2, 1985, Ser. No. 751,180
Int. Cl.[4] G07B 3/08; H04N 5/72
U.S. Cl. 350—276 R 5 Claims



1. An optical element for magnifying and enhancing the image projected from a screen and for reducing glare produced by light generated externally of said screen and reflected from said screen, comprising:

at least one fresnel lens supported adjacent said screen for magnifying the image generated by said screen;

a laminated light filter supported adjacent and parallel to said fresnel lens for reducing said glare and for enhancing said image;

said laminated light filter having a first element to retard said light generated externally and passing therethrough;

a second element positioned parallel to and adjacent said first element to vary the color of the image projected from said screen; and

a third element positioned parallel to and adjacent said first and second element to capture said retarded light preventing said light from exiting said filter;

whereby said glare is reduced and said images magnified and enhanced.

4,577,929

ANTI-GLARE DEVICE FOR SIDE MOUNTED REAR VISION MIRRORS

Richard H. Guillen, 9027 Rendalia, Bellflower, Calif. 90706

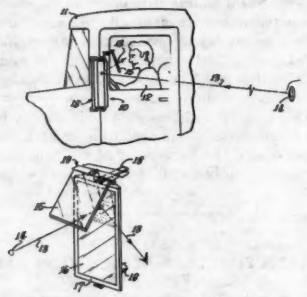
Filed Feb. 21, 1984, Ser. No. 581,962
Int. Cl.[4] G02B 5/08, 7/24
U.S. Cl. 350—283 8 Claims

1. A rear vision mirror anti-glare and rain deflecting device

combination affixable to the exterior of a motor vehicle, said device comprising:

a mirror mounting bracket affixed to the exterior of a motor vehicle;

mirror means affixed to said mirror mounting bracket by an upper arm affixed to the bracket and to the top of the mirror means and a lower arm affixed to the bracket and to the bottom of the mirror means, said mirror means



being mounted about vertically on said mounting bracket between said upper arm and said lower arm; and

transparent shield means affixed to said upper arm at a small distance above the top edge of the mirror means and affixed at an angle of between 10 and 80 degrees with respect to said mirror means, said transparent shield means having a length which is less than the length of said mirror means.

4,577,930

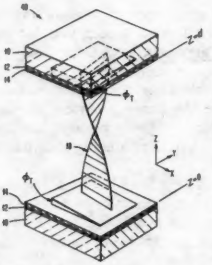
WEAK BOUNDARY STORAGE LIQUID CRYSTAL DISPLAY DEVICES WITH BIAS VOLTAGE

Kei-Hsiung Yang, Somers, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 24, 1982, Ser. No. 381,281

Int. Cl.[4] G02F *1/133*

U.S. Cl. 350—332 **19 Claims**



1. In a liquid crystal display cell of the type comprising:

upper and lower spaced substrates;

upper and lower electrodes respectively formed on the inner surfaces of said upper and lower substrates;

liquid crystal material interposed between said upper and lower electrodes;

means for imposing an electric field between said upper and lower electrodes having an adjustable range from a *bias voltage with a* magnitude below a threshold level for said liquid crystal material to [one] *a voltage* exceeding said threshold level and sufficient for causing the molecules of said liquid crystal material to orient from a first orientation arrangement to a second orientation arrangement; and

means on said upper and lower electrodes providing a surface treatment of said upper and lower electrodes adjacent said liquid crystal material;

the improvement wherein said liquid crystal material is a nematic liquid crystal material, having both its boundary layer and bulk molecules aligned in said first orientation in the field free state, and a storage effect is achieved by:

said surface treatment means [comprising means for] rendering the liquid crystal material-to-substrate anisotropic surface anchoring force sufficiently weak so as to prevent the restoration of said molecules from said second orientation to said first orientation arrangement, when said electric field is lowered from above said threshold level to [a level below] said *bias voltage* [threshold level].

4,577,931

LIQUID CRYSTAL COMPOSITION

Bunzo Kiyonaga, Shiojiri, Japan, assignor to Epson Corporation, Nagano, Japan

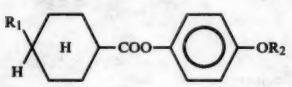
Filed May 24, 1983, Ser. No. 497,532

Claims priority, application Japan, May 26, 1982, 57-89296

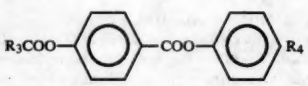
Int. Cl.[4] C09K *3/34;* G02F *1/13*

U.S. Cl. 350—350 R **25 Claims**

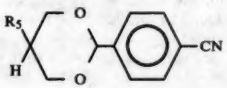
1. A liquid crystal composition comprising at least one compound of each of formulas (1) and (2), and at least one of the compounds of formulas (3) and (6):



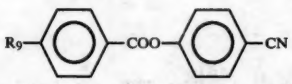
(1)



(2)



(3)



(6)

where R_1 is a straight-chain alkyl group having 2 to 6 atoms; R_2 is a straight-chain alkyl group having 1 to 6 carbon atoms; R_3 is a straight-chain alkyl group having 3 to 6 carbon atoms; R_4 is a straight-chain alkyl group having 1 to 5 carbon atoms; R_5 is a straight-chain alkyl group having 2 to 8 carbon atoms, and R_9 is a straight-chain alkyl group having 2 to 8 carbon atoms, and including about 40 to 65 weight percent of compounds of formula (1), about 20 to 30 weight percent of compounds of formula (2), and when present about 7 to 20 weight percent of compounds of formula (3) and when present about 7 to 20 weight percent of compounds of formula (6).

4,577,932

MULTI-SPOT MODULATOR USING A LASER DIODE

Daniel Gelbart, Burnaby, Canada, assignor to Creo Electronics Corporation, Burnaby, Canada

Filed May 8, 1984, Ser. No. 608,222

Int. Cl.[4] G02F *1/11;* H04N *5/74*

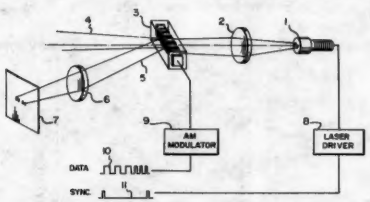
U.S. Cl. 350—358 **3 Claims**

1. A multi-spot light modulator comprising:

a laser operating in the pulsed mode; an acousto-optic modulator and means for converting a data pattern into a corresponding acoustic wave inside said modulator, said modu-

lator for diffracting a beam from said laser; a lens for focussing a light pulse from said laser onto said acoustic wave;

a light sensitive material for generating a permanent record;



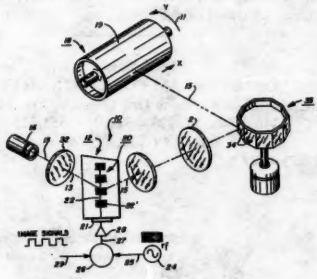
a second lens located in said diffracted output beam of said modulator for forming an image of said acoustic wave onto said light sensitive material; and means for synchronizing said light pulse with said data pattern in order to generate a permanent record of said data pattern on said light sensitive material.

4,577,933

GAP MODULATOR FOR HIGH SPEED SCANNERS

Kwok-leung Yip, Webster, and Joseph J. Daniele, Pittsford, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 15, 1983, Ser. No. 561,860
Int. Cl.[4] G02F *1/33*; H04N *3/08*
U.S. Cl. 350—358 **3 Claims**



1. A pulse imaging scanner comprising:

a recording member, the scanner being operable in a resolution mode to scan said recording member and create images thereon;

a high intensity beam of electromagnetic radiation;

a rotatable scanning element interposed between said recording member and said beam, said scanning element having a plurality of facets for intercepting said beam to repeatedly scan said beam across said recording member;

an acousto optic type modulator for modulating said beam in response to image signals to create images on said member in response to the signal content of said image signals, said modulator comprising a substantially pure, undoped gallium phosphide crystal, said modulator having a center operating frequency of at least 500 MHz to permit high frequency modulation of said beam in response to said image signals for high speed, high resolution scanning, said modulator having an operating bandwidth of approximately 175 MHz at a relative operating intensity of 0.9 for capturing said beam center band and at least said beam upper and lower side bands to provide sufficient intensity to expose said recording member at said high frequency while enabling facet tracking of said beam on said scanning element facets;

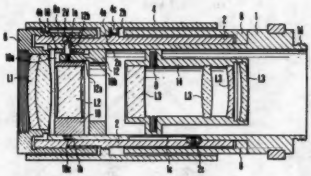
said scanning element facets having a facet width sufficient to capture said beam center and first upper and lower side bands whereby to scan said beam across said recording member without intensity loss.

4,577,934

MECHANICAL MOUNTING FOR A ZOOM LENS

Masao Aoyagi, Kanagawa; Kazufumi Kobayashi, and Keiichi Yasuda, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 21, 1985, Ser. No. 703,737
Claims priority, application Japan, Feb. 21, 1984, 59-24078[U]
Int. Cl.[4] G02B *7/10*
U.S. Cl. 350—430 **1 Claim**



1. A mechanical mounting for a zoom lens comprising:

(a) a body tube;

(b) a single actuator member;

(c) an intermediate sleeve arranged between said body tube and said single actuator member, said intermediate sleeve moving axially as a unit with said actuator member and rotating relative to said actuator member;

(d) a variator lens cell arranged inside said body tube, said lens cell having a groove and a penetration hole;

(e) a rotary ring arranged inside said body tube, said rotary ring having an armed portion in engagement with said groove of said lens cell;

(f) a connection pin engaging with said armed portion, said connection pin passing through said penetration hole of said lens cell to engage with said body tube and said intermediate sleeve, whereby axial movement of said single actuator member gives rotative movement to said lens cell through said connection pin and said rotary ring; and

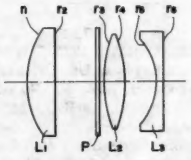
(g) an engaging member and a camming groove arranged between said lens cell and said body tube, whereby the rotative movement of said lens cell is converted to an axial movement.

4,577,935

VIDEO PROJECTOR LENS SYSTEM

Kazuo Yamakawa, Sakai, and Toshihide Dohi, Minamikawachi, both of Japan, assignors to Minolta Camera Kabushika Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 234,990, Feb. 17, 1981, abandoned. This application Feb. 8, 1982, Ser. No. 347,032
Claims priority, application Japan, Mar. 3, 1980, 55-28859; Sep. 8, 1980, 55-109604; Jan. 8, 1982, 57-1947
Int. Cl.[4] G02B *3/02, 9/12*
U.S. Cl. 350—432 **11 Claims**



1. A lens system for projecting onto a screen a video image formed on a face plate of a cathode ray tube comprising, from the screen to the tube side:

a first positive lens unit;

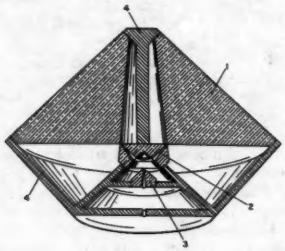
a second positive lens unit defined between a pair of convex surfaces, and

a third negative lens unit having a screen side concave surface, wherein the lens system includes at least one aspheric surface and fulfills the following condition:

$$1.5f<f_1<2.0f,$$

wherein f represents the focal length of the whole lens system; and f_1 represents the focal length of the first positive lens unit.

4,577,936
CONICAL BEAM CONCENTRATOR
John E. Clegg, 2320 Keystone Dr., Orlando, Fla. 32806
Filed Oct. 1, 1984, Ser. No. 656,807
Int. Cl.[4] G02B *13/18*
U.S. Cl. 350—432 1 Claim



1. A conical beam concentrator comprising in general three component lenses which receive a convergent conical incipient beam of diffused sunlight and emit a concentrated circular whole beam parallel to the optic axis of the lenses, and comprising in particular;

an upper component lens RT (1) having a convex conical section (6) which receives and transmits a convergent conical incipient beam (5) of diffused sunlight, and having a concave conical section (7) which refracts incipient beam (5), forming annular beam (9), and having a planar section (8) which refracts incipient beam (5), forming convergent conical beam (10),

a middle component lens RT (2) mounted below upper component lens RT (1) and having a planar section (11) which transmits annular beam (9), having a convex conical section (12) which transmits convergent conical beam (10), having a convex conical section (14) which refracts annular beam (9) and a concave conical section (13) which refracts convergent conical beam (10), forming convergent conical beam (15), and

a lower component lens RT (3) mounted below middle component lens RT (2) and having a convex conical section (16) which transmits convergent conical beam (15), and having a concave conical section (17) which refracts convergent conical beam (15), forming concentrated whole beam (18) which is emitted parallel to the optic axis of the concentrator.

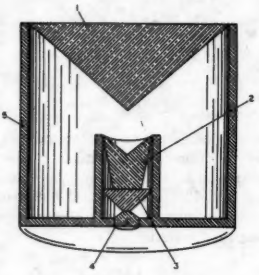
4,577,937
CONICAL BEAM CONCENTRATOR
John E. Clegg, 2320 Keystone Dr., Orlando, Fla. 32806
Filed Oct. 1, 1984, Ser. No. 656,569
Int. Cl.[4] G02B *13/18*
U.S. Cl. 350—432 1 Claim

1. A conical beam concentrator 4RT:C comprising in general four conical component lenses which receive a circular whole incipient beam of direct sunlight and emit a circular whole concentrated beam, and comprising in particular;

an upper component lens RT (1) having a planar section (7) which receives and transmits a circular whole incipient beam (6) of direct sunlight and having a convex conical section (8) which refracts incipient beam (6), forming a convergent conical beam (9),

a first middle component lens RT (2) having a concave conical switch (10) which transmits convergent conical beam (9) and having a convex conical section (11) which refracts convergent conical beam (9), forming annular beam (12),

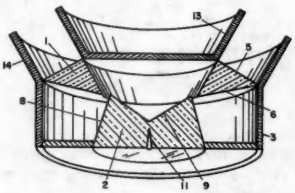
a second middle component lens RT (3) having a planar



section (13) which transmits annular beam (12) and having a convex conical section (14) which refracts annular beam (12), forming a convergent conical beam (15), and

a lower component lens RT (4) having a convex conical section (16) which transmits convergent conical beam (15) and having a concave conical section (17) which refracts convergent conical beam (15), forming a concentrated circular whole beam (18) which is emitted parallel to the vertical optic axis of the lenses.

4,577,938
CONICAL BEAM CONCENTRATOR
John E. Clegg, 2320 Keystone Dr., Orlando, Fla. 32806
Filed Sep. 17, 1984, Ser. No. 651,015
Int. Cl.[4] G02B *13/18*
U.S. Cl. 350—432 1 Claim



1. A conical beam concentrator comprising in general two component lenses which receive a convergent conical incipient beam of diffused sunlight and emit a concentrated whole beam parallel to the optic axis of the lenses, and comprising in particular;

an upper component lens RT (1) having a convex conical section (5) which receives and transmits a convergent conical incipient beam (4) of diffused sunlight, and having a convex conical section (6) which refracts and emits incipient beam (4), forming convergent conical concentrated beam (7), and

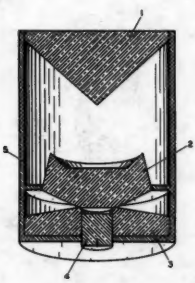
a lower component lens RLT (2) having a convex conical section (8) which transmits concentrated beam (7), having a convex conical reflective section (9) which reflects concentrated beam (7), forming convergent conical beam (10), and having a concave conical section (11) which refracts and emits convergent conical beam (10), forming concentrated whole beam (12) which is emitted parallel to the vertical optic axis of the lenses.

4,577,939

MONOCHROMATIC BEAM CONCENTRATOR

John E. Clegg, 2320 Keystone Dr., Orlando, Fla. 32806

Filed Oct. 11, 1984, Ser. No. 659,813
Int. Cl.[4] G02B *13/18, 17/08*
U.S. Cl. 350—443 1 Claim



1. A monochromatic beam concentrator 2RR-RLT-RT:CM comprising in general four component lenses which receive a circular whole incipient beam of direct sunlight and emit a concentrated circular whole beam of monochromatic light, and comprising in particular;

An upper component lens RD (1) having a planar section (7) which receives and transmits a circular whole incipient beam (6) of direct sunlight and having a convex conical section (8) which refracts said incipient beam (6), forming a convergent conical beam (9),

A first middle component lens RLT (2) mounted below said upper component lens RT (1) and having a concave conical section (10) which transmits said convergent conical beam (9), and having a convex conical reflective section (11) which reflects said convergent conical beam (9), and having a convex conical section (12) which refracts said convergent conical beam (9), forming a convergent conical beam (13),

A second middle component lens RR (3) mounted below said first middle component lens RLT (2) and having a convex conical section (14) which refracts said convergent conical beam (13), forming spectral beam (15), and having a concave cylindrical section (16) which refracts and emits said spectral beam (15), and

A lower component lens RR (4) mounted below said second middle component lens RR (3) and having a convex cylindrical section (17) which refracts said spectral beam (15), and having a concave conical section (18) which refracts said spectral beam (15), forming a concentrated monochromatic circular whole beam (19) which is emitted parallel to the vertical optic axis of the lenses.

4,577,940

MOIRE MICROSCOPE

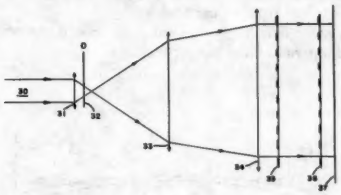
Jerzy S. Krasinski, Green Brook; Donald F. Heller, Bound Brook, both of N.J., and Oded Kafri, Beer-sheva, Israel, assignors to Allied Corporation, Morris Township, N.J.

Filed Dec. 19, 1984, Ser. No. 683,832
Int. Cl.[4] G02B *21/36*
U.S. Cl. 350—502 7 Claims

1. An apparatus for moire microscopy comprising, in combination and spaced apart successively along an optic axis,

(a) an objective lens for focusing a light beam from an object,

(b) a collimating lens, for collimating the beam from the objective lens, and



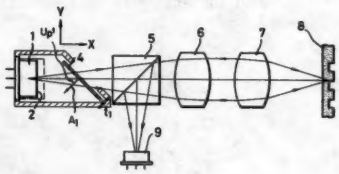
(c) two spaced-apart gratings for producing from the collimated beam a magnified moire deflectogram of the object.

4,577,941

OPTICAL APPARATUS

Shigeo Kubota, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 459,932, Jan. 21, 1983. This application Aug. 26, 1985, Ser. No. 770,000
Claims priority, application Japan, Feb. 19, 1982, 57-25522; Aug. 6, 1982, 57-136986
Int. Cl.[4] G02B *5/00*
U.S. Cl. 350—582 1 Claim



1. An optical apparatus comprising:

a semiconductor laser having first and second emitting points for first and second groups of light rays, respectively, said first group of light rays being emitted in a junction plane of said semiconductor laser, and said second group of light rays being emitted in a plane perpendicular to said junction plane and in the direction of propagation as said first light rays;

a cap element covering said semiconductor laser and having an aperture formed therein;

focusing means to produce focused light of said first and second group of light rays; and

at least one plane-parallel, light transmitting body of predetermined thickness arranged in the aperture of said cap element and before the focusing means and inclined at a predetermined angle relative to the direction of propagation so as to cause the astigmatism of said optical apparatus to be substantially zero and to minimize the coma of said optical apparatus.

4,577,942

LAMINATED HIGH CORRECTION EYEGLASS LENS

Philip M. Frieder, Miami, and Edward de Rojas, Lauderhill, both of Fla., assignors to Optical Systems International, Inc., Hialeah, Fla.

Filed Feb. 22, 1983, Ser. No. 468,694
Int. Cl.[4] G02C *7/02, 7/06*
U.S. Cl. 351—159 10 Claims

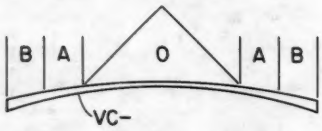
1. A high correction eyeglass lens comprising, in combination,

a prescription base lens having a high index of refraction,

said prescription base lens being conformed to a high plus or minus correction,

a veneer lens proportioned to physically and optically laminate to the front of the base lens,

said veneer lens having a central zone without correction and a peripheral annular zone,



said peripheral annular zone having only progressive negative correction proceeding from the central zone to the edge of the lens,

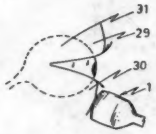
said negative correction offsetting vertex power error.

4,577,943

METHOD AND APPARATUS FOR SELF-EXAMINATION OF THE OCULAR GLOBE

Miguel Salia-Munoz, 7a. Privada de Azafran Col., Granjas, Mexico

Filed Jan. 21, 1983, Ser. No. 459,967
Claims priority, application Mexico, Aug. 27, 1982, 194193
Int. Cl.[4] A61B *3/10, 3/00*
U.S. Cl. 351—205 **3 Claims**



1. A method of self-examining by a patient of the interior of the ocular globe, which comprises applying a light source to the outer surface of the lower eyelid, with the eye closed in order to permit the entrance of the light from said light source only through the thickness of said lower eyelid and without said light passing directly through the crystalline or other focusing element of the eye, whereby the interior structure of the eye is rendered visible to the patient directly through perception by the light sensitive cells of the retina.

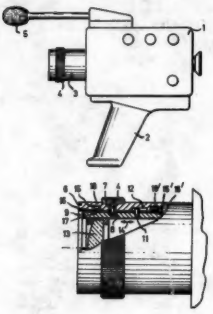
4,577,944

LENS MOUNT WITH NOISE REDUCING MEANS

Siegfried Grosser, Heidenheim; Christian Ludwig, Oberkochen; Kurt Wallner, Eching/Dietersheim; Karl Herzog, Taufkirchen, and Eugen Bayerl, Kirchheim, all of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim on the Brenz, Fed. Rep. of Germany

Filed Nov. 28, 1984, Ser. No. 675,507
Int. Cl.[4] G03B *31/00*
U.S. Cl. 352—35 **10 Claims**

1. A camera lens mount having provision for impeding transmission of sound from within a camera through the mount to a point in front of the camera, comprising a first mounting part attached to a camera, a second mounting part movable with respect to the first mounting part for focusing, said second part carrying at least one optical component, a groove formed in one of said mounting parts in a direction transverse to the direction of movement of said second mounting part relative to said first mounting part, and a sound damping element of material having good dry-sliding properties seated in said groove and resiliently engaging the other of said mounting



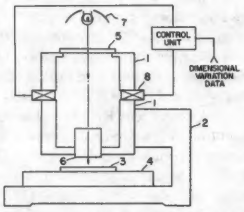
parts to impede transmission of sound in an axial direction along said lens mount.

4,577,945

PATTERN TRANSFER DEVICE AND METHOD

Kuniya Shimazaki, Kawasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 10, 1984, Ser. No. 578,815
Claims priority, application Japan, Feb. 14, 1983, 58-22511
Int. Cl.[4] G03B *3/10*
U.S. Cl. 353—101 **7 Claims**



1. A pattern transfer device comprising:

a main table upon which is mounted an object;

a lens barrel having a first section and a second section, one end of said first section being adapted to receive an original and a distal end of said second section being adapted to receive a high resolving power lens for focusing an image of said original on said object;

control means for determining a dimensional variation in said object and for producing a control signal based on said dimensional variation as detected; and

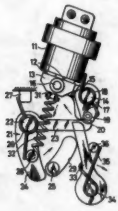
a reduction ratio adjustment means, coupled between said first and second sections and responsive to said control means, for varying the length of said lens barrel in response to said control signal to vary the size of the image focused on said object through said high resolving power lens.

4,577,946

ELECTROMAGNETIC RELEASE DEVICE FOR SINGLE-LENS REFLEX CAMERA

Tahei Morisawa, Tokyo, Japan, assignor to Asahi Kogaku Kogyo K.K., Tokyo, Japan

Filed Apr. 4, 1984, Ser. No. 596,750
Claims priority, application Japan, Apr. 6, 1983, 58-50245[U]
Int. Cl.[4] G03B *19/12*
U.S. Cl. 354—152 5 Claims



1. In an electromagnetic release device for a single-lens reflex camera having an electromagnet adapted to release an armature therefrom, and an armature lever including said armature, said armature lever being turned to release a mirror driving lever from locking engagement upon release of said armature from said electromagnet, said mirror driving lever being turned when unlocked by rotation of said armature lever to lift the mirror of said camera, the improvement comprising:

an energizing spring urging said armature lever towards said electromagnet; and

an armature disengaging spring connected between said armature lever and said mirror driving lever urging said armature lever away from said electromagnet,

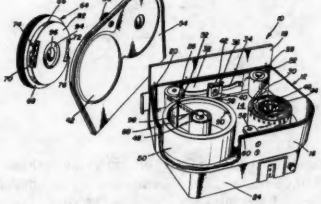
said armature disengaging spring being positioned and having a spring constant such that a tensile force provided thereby for moving said armature lever away from said electromagnet when said mirror driving lever reaches an upper position thereof is smaller than the force of said energizing spring urging said armature lever towards said electromagnet.

4,577,947

FILM MAGAZINE

Anthony G. Fox, Signal Mountain; Harry L. O. Smith, Cleveland, and Ehsan Sadre-Marandi, Chattanooga, all of Tenn., assignors to Beattie Systems, Inc., Cleveland, Tenn.

Filed Feb. 25, 1985, Ser. No. 705,141
Int. Cl.[4] G03B *17/26*
U.S. Cl. 354—275 17 Claims



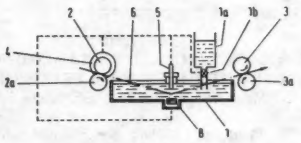
1. In a film magazine for use with a camera, said magazine comprising a housing having a base and upstanding wall means extending from the base defining a container for accommodating a web of film wound in a roll around a supply spool means, means for rotatably mounting said supply spool means in said container, take-up means for receiving the film from said supply, an aperture defined in said container intermediate said supply means and said take-up means, guide means for guiding the film from the supply means across the aperture to the take-up means, feed means for feeding and winding the film on the take-up means, and a cover for closing the container, the improvement comprising: a second housing defined by another upstanding wall means disposed within said container about said take-up means, a slit formed in said second housing defining a light trap opening from the container into said second housing for permitting film to enter the interior of said second housing for receipt by said take-up means, means defining an access port in said cover opening into said second housing to isolate entry into the second housing from the remainder of said container, and closure means for securely closing said port and selectively permitting access through said port into the second housing, whereby film on said take-up means may be removed without removal of said cover.

4,577,948

METHOD AND APPARATUS FOR CONTROLLING THE PROCESSING OF RADIATION SENSITIVE PLATES WITH A LIQUID BY MONITORING THE ELECTRICAL CONDUCTIVITY OF THE LIQUID

Leslie E. Lawson, Surbiton, and Michael Ingham, Bramley, both of England, assignors to Vickers PLC, England

Filed Oct. 20, 1983, Ser. No. 543,919
Claims priority, application United Kingdom, Oct. 21, 1982, 8230105
Int. Cl.[4] G03D *3/06, 3/08*
U.S. Cl. 354—299 9 Claims



1. An apparatus for processing image-wise exposed radiation sensitive plates which apparatus comprises

(i) a container for processing liquid,

(ii) a means of moving the plates along a path through the apparatus so that they are contacted by the processing liquid under given processing conditions,

(iii) a means for measuring the electrical conductivity of the processing liquid and for producing an output signal in dependence on said conductivity, and

(iv) a means of varying the processing conditions in dependence on said output signal

wherein said means of varying the processing conditions includes a variable speed motor for driving the plate moving means and controlled by said output signal so that the period of time for which the plates are in contact with the processing liquid is dependent on the conductivity.

4,577,949

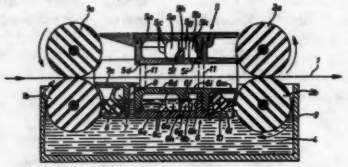
DEVELOPING DEVICE FOR A HORIZONTALLY, TRANSPORTED PHOTOGRAPHIC LAYER CARRIER

Erwin Geyken, Neubiberg; Franz Heckl, Toeging am Inn; Alfons Kastl, Munich; Klaus Lehnert, and Rudolf Loistl, both of Unterhaching, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Nov. 30, 1984, Ser. No. 678,004
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1983, 3345084
Int. Cl.[4] G03D *3/02, 3/08*
U.S. Cl. 354—319 24 Claims

1. A developing device for developing a photographic layer carrier, particularly sheet film, comprising an inlet pair of rotary transport rollers; an outlet pair of rotary transport rollers spaced from said inlet pair, said inlet pair of rollers and said

outlet pair of rollers transporting a photographic layer carrier to be developed in the horizontal direction; means forming an upper liquid-admitting chamber and means forming a lower liquid-admitting chamber positioned opposite to each other and spaced from each other to define a processing space therebetween in which the layer carrier is transported, each of said chambers being supplied with a processing liquid under pressure, each means including a passage extended over the entire width of each means and a slot extended over about the entire



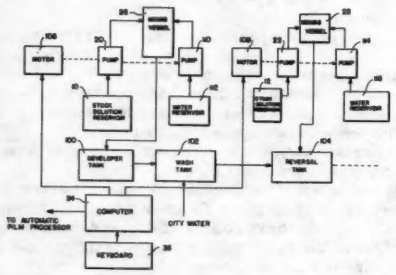
width of the layer carrier, the processing liquid being admitted through said passage of each means and being discharged through the slot of each means into said processing space towards the layer carrier, each chamber including a comb-like partition means subdividing each chamber into two substantially parallel passage portions, said partition means extending over the length of each chamber and over the width of the layer carrier, the processing liquid being pumped into a first one of said two portions of each chamber, and said slot being formed in a second portion of each chamber.

4,577,950

COMPUTER CONTROLLED REPLENISHING SYSTEM FOR AUTOMATIC FILM PROCESSOR

Richard G. Mackson, 2239 - 26th St., Santa Monica, Calif. 90405

Filed Jul. 13, 1984, Ser. No. 630,825
Int. Cl.[4] G03D *3/06*
U.S. Cl. 354—324 **5 Claims**



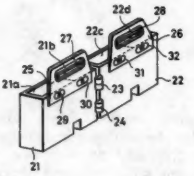
1. A system for controlling replenishment solution to a photographic film processor, said system comprising: a reservoir containing a solution concentrate; metering means coupled to the reservoir for transferring a metered quantity of the concentrate from the reservoir to the processor as a replenishment solution; computer means electrically connected to said metering means for activating said metering means for a time interval computed by said computer means, said computer means including a memory in which data representing pre-calculated amounts of concentrate consumed by various sizes of films is stored; and input means including a manually operated keyboard connected to said computer means for inputing data to said computer means concerning the size of the next film to be processed by the film processor so as to enable said computer means to compute the correct time interval required for the metering means to transfer the correct replenishing amount of said concentrate to the processor for the next film to be processed, and to activate said metering means for said correct time interval.

4,577,951

PROCESSING SOLUTION TANK WITH HINGED SECTIONS

Yutaka Takahashi, and Hiroshi Matsuoka, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 21, 1984, Ser. No. 652,995
Claims priority, application Japan, Sep. 28, 1983, 58-150080[U]
Int. Cl.[4] G03D *13/04, 3/13*
U.S. Cl. 354—331 **6 Claims**



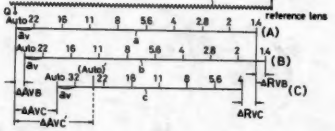
1. In a processing solution tank for a lightsensitive material-processing apparatus having a plurality of processing vessels separated from each other by partitions, the improvement wherein said processing solution tank is divided into two sections hingedly connected to one another, and a carrying handle is fitted to a main body of each of said sections, said handle having a solid portion such that processing solutions in said two sections are prevented from mixing with each other when said sections are folded into abutment.

4,577,952

PHOTOGRAPHIC CAMERA HAVING A DIAPHRAGM ACTUATOR WITH PRELIMINARY DISPLACEMENT FOR LENS COMPENSATION

Fumio Urano; Zenichi Okura, and Masahiro Kawasaki, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 28, 1984, Ser. No. 584,521
Claims priority, application Japan, Feb. 28, 1983, 58-32589
Int. Cl.[4] G03B *17/18*
U.S. Cl. 354—455 **12 Claims**



1. Method for display of diaphragm value and shutter speed in a multimode photographic camera using an interchangeable lens in which light intensity error in the film plane and light intensity error as measured at a position of a photometric element both depending on an individual interchangeable lens have been determined collectively as a primary quantity of error peculiar to this interchangeable lens relative to a reference lens, said interchangeable lens has been provided with its diaphragm value indices at positions deviating from the respective diaphragm value indices carried on the reference lens by said primary quantity of error peculiar to this particular inter-

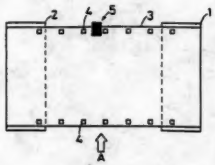
changeable lens, the method comprising steps of providing said interchangeable lens with an AUTO position at a suitable angular distance from the minimum diaphragm value position of said interchangeable lens, taking out a signal representative of this AUTO position as an electric signal, and subjecting such electric signal together with the other exposure determining information such as brightness of an object to be photographed to arithmetic processing to effect display of a diaphragm value and/or a shutter speed in a shutter speed priority mode or in a programmed mode.

4,577,953

APPARATUS FOR DETECTING NORMAL/ABNORMAL MOUNTING OF BELT-LIKE PHOTOSENSITIVE MEMBER IN COPYING MACHINE

Atsushi Narukawa, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 21, 1984, Ser. No. 684,738
Claims priority, application Japan, Dec. 24, 1983, 58-248341
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—3 BE 1 Claim



1. An apparatus for automatically identifying either the satisfactory or improperly installed condition of a belt-like photosensitive member in such a copying machine provided with a belt-like photosensitive member freely mountable and detachable between a pair of rollers and also with either a plurality of cutout portions or markers on the lateral sides of the belt-like photosensitive member detectable by sensor means incorporated in the copy machine wherein the identifying apparatus comprises;

a timer starting the counting operation when the photosensitive member diagnosis mode is entered simultaneous with the start of the roller rotation after turning the power of the copy machine ON;

means for identifying whether the output signal from sensor means varies or not during a period when the timer counts a specific period of timer; and

means for alarming the operator that the photosensitive member is improperly installed onto rollers only when the output signal from sensor means remains unchanged within a specific period of time counted by the timer.

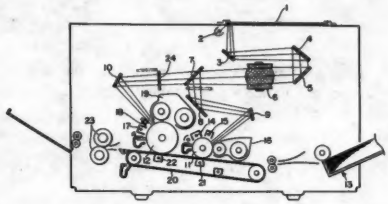
4,577,954

TWO-COLOR COPYING APPARATUS

Norio Kajiwara, Ichikawa, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Mar. 6, 1984, Ser. No. 586,672
Claims priority, application Japan, Mar. 7, 1983, 58-36010
Int. Cl.[4] G03G *15/01*
U.S. Cl. 355—4 7 Claims

1. A two-color copying apparatus for producing copies in two colors from an original having regions of black color and regions of a second color which is a chromatic color, comprising two photosensitive drums having substantially parallel axes and located adjacent each other, one of the two photosensitive drums serving as a chromatic color image forming photosensitive drum and the other photosensitive drum serving as a black image forming photosensitive drum, and an exposing optical system having an image forming lens, and a half reflecting mirror located in a path of light beam posterior to said image forming lens, said half reflecting mirror being operative to split a light beam reflected by the original into two sub-beams of light which are projected on to outer circumferential surfaces of said two photosensitive drums in two predetermined positions of the respective drums to form electrostatic latent images corresponding to the regions of the chromatic color and the image regions of black color respectively of the original, said electrostatic latent image having the image regions of the chromatic color being developed by using a toner of the chromatic color to form a toner image of the chromatic color on an outer circumferential surface of the chromatic color image forming photosensitive drum and said electrostatic latent image having the image regions of black color image being developed by using a toner of black color to form a toner image of black color on an outer circumferential surface of the black image forming photosensitive drum, said toner image of the chromatic color and said toner image of black color being



successively printed by transfer-printing in overlapping relation on a transfer-printing sheet conveyed by a conveyor belt and brought into contact with the outer circumferential surfaces of the two photosensitive drums in such a manner that the image regions of the chromatic color and the image regions of black color of the toner images printed on the photosensitive sheet have substantially the same positional relations to the regions of the chromatic color and the regions of black color of the original to thereby produce a copy of the original in two colors, wherein the improvement resides in that:

one of said two sub-beams of light obtained by splitting the light beam reflected by the original which is reflected by said half reflecting mirror serve only as a chromatic color image forming sub-beam of light and the other sub-beam of light transmitted tnrough said half reflecting mirror serves as the black image forming sub-beam of light.

4,577,955

ELECTROPHOTOGRAPHIC COPYING APPARATUS INCLUDING A GUILLOTINE CLEANER BLADE ARRANGEMENT AND METHOD OF OPERATION

Edward F. Mayer, and Donald F. Pfeuffer, both of San Jose, Calif., assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 18, 1983, Ser. No. 553,108
Int. Cl.[4] G03G *21/00*
U.S. Cl. 355—15 14 Claims

1. An assembly for cleaning the charged surface of a developing drum of electrically charged toner particles which are attracted to the surface of said drum comprising:

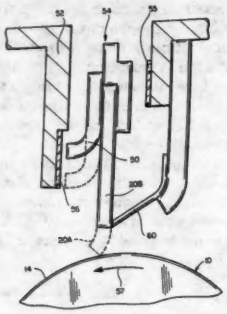
a movable parallelogram-shaped frame for carrying a cleaning blade toward and away from contact with said developing drum,

a support for said parallelogram frame, said parallelogram frame being movable with respect to said support,

means for initiating movement of said parallelogram frame toward said drum,

said parallelogram frame providing both axial and radial components of movement of said blade with respect to said developing drum in moving said blade into contact with said drum, said parallelogram frame being relatively loosely mounted in said support, rotation of said drum causing a limited deflection of said blade in the direction

of movement of said drum whereby a wiping action of said drum surface is established, said parallelogram frame



including a finger extending laterally of the direction of travel of said parallelogram frame to limit the deflection of said blade.

4,577,956

PROCESS FOR THE CHAOTIC FILMING OF DOCUMENTS AND DEVICE FOR THE COMPLETION THEREOF

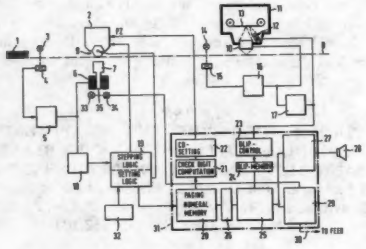
Rolf Klosterhuber, Stieglitzweg 17, D-8033 Krailling, and Wolfgang Herrle, Hohenzollernstr. 14, 8000 München 40, both of Fed. Rep. of Germany

Filed Jun. 3, 1983, Ser. No. 500,710

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1982, 3220977; Feb. 3, 1983, 3303647

Int. Cl.⁴ G03B *27/52*

U.S. Cl. 355—40 **34 Claims**



26. Device for chaotic filming of documents which are provided with a first code, comprising a camera (111) which is fitted with a device (112) for selectively issuing a pulse code recordable on the film, a force feed for the documents to be filmed, a scanner (106) in front of said camera (111) which reads the first code on said document (102), a check computer (117) to which signals from the scanner (106) are fed, said check computer controlling a device for actuating said camera (111) and/or the device (112) for the selective issuing of a pulse code and feeding a signal to a first intermediate memory (129) connected to the check computer (117), a second intermediate memory (126) which adds up the pulse codes recorded on the film, and a linkage circuit (127) which links incoming signals from the first and second intermediate memories (129,126) and conveys them to a computer (103) for being stored in it.

4,577,957

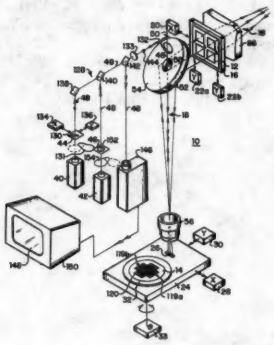
BORE-SIGHTED STEP-AND-REPEAT PROJECTION ALIGNMENT AND EXPOSURE SYSTEM

Edward H. Phillips, Middletown, Calif., assignor to Eaton-Optimetrix, Inc., San Jose, Calif.

Continuation of Ser. No. 456,494, Jan. 7, 1983, abandoned. This application Mar. 11, 1985, Ser. No. 710,231

Int. Cl.⁴ G03B *27/52, 27/70*

U.S. Cl. 355—43 **68 Claims**



1. A step-and-repeat alignment system for aligning first and second objects, said system comprising:

first stage means for holding the first object;

second stage means for holding the second object;

a first reference indicium disposed on the second stage means;

first optical means for producing an image of the first object in an image plane of the first optical means and for viewing an image of one of the first reference indicium and the second object as illuminated by the image of the first object;

said first stage means being operable with the first optical means for aligning an image of a first portion of the first object with respect to a first portion of the first reference indicium;

said second stage means being operable with the first optical means for aligning the second object with respect to an image of the first object and for aligning a second portion of the first reference indicium with respect to an image of a second portion of the first object;

a second reference indicium;

second optical means, operable with the first optical means, for producing an image of the second reference indicium in the image plane of the first optical means and for viewing an image of one of the first reference indicium and the second object as illuminated by the image of the second reference indicium; and

adjustment means, operable with the first and second optical means, for aligning the image of the second reference indicium with respect to a third portion of the first reference indicium;

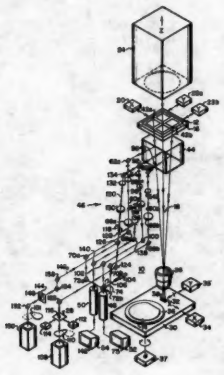
said second stage means also being operable with the first and second optical means for aligning the second object with respect to the image of the second reference indicium.

4,577,958

BORE-SIGHTED STEP-AND-REPEAT PROJECTION ALIGNMENT AND EXPOSURE SYSTEM

Edward H. Phillips, Middletown, Calif., assignor to Eaton Optimetrix, Inc., San Jose, Calif.

Continuation of Ser. No. 389,678, Jun. 18, 1982, abandoned.
This application Mar. 11, 1985, Ser. No. 710,232
Int. Cl.[4] G03B 27/52, 27/70, 27/42
U.S. Cl. 355—43 57 Claims



1. A step-and-repeat alignment system for aligning first and second objects, said system comprising:

first positioning means for holding the first object;

second positioning means for holding the second object;

a first reference indicium disposed on the second positioning means;

first optical means for producing an image of the first object in an image plane of the first optical means;

said first positioning means being operable for aligning the image of the first object with respect to the first reference indicium;

third positioning means for holding a second reference indicium; and

second optical means, operable with the first optical means, for producing an image of the second reference indicium in the image plane of the first optical means;

said third positioning means being operable for aligning the image of the second reference indicium with respect to the first reference indicium; and

said second positioning means being operable for aligning the second object with respect to the image of the second reference indicium.

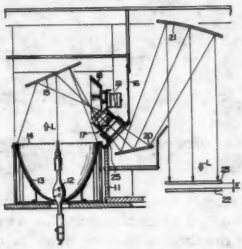
4,577,959

EXPOSURE APPARATUS

Yoshio Yazaki, Chofu, Japan, assignor to ORC Manufacturing Co., Ltd., Tokyo, Japan

Filed May 29, 1984, Ser. No. 615,032
Claims priority, application Japan, Feb. 10, 1984, 59-24093
Int. Cl.[4] G03B 27/54
U.S. Cl. 355—67 9 Claims

1. An exposure apparatus for exposing a workpiece to light, which light passes through a mask so that exposed portions of the workpiece correspond to a pattern of the mask, said apparatus comprising: light source means for emitting light to expose the workpiece, first optical system means for condensing the light emitted from said light source means to form a light beam and to project the light beam along a first path, a fly eye lens operatively disposed along said first path wherein the light beam condensed by said first optical system means passes through said fly eye lens, second optical system means for collimating the light beam passing through said fly eye lens to direct the collimated light beam along a second path to the workpiece through the mask to expose portions of the workpiece to the collimated light beam which correspond to the pattern of the mask, mounting means for mounting said fly eye



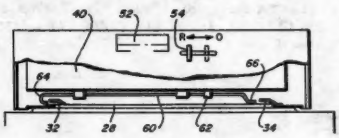
lens for rotation about an axis established by said first path, and lens drive means for rotating said fly eye lens at a predetermined number of revolutions about said axis.

4,577,960

DOCUMENT REGISTRATION APPARATUS

Robert G. Zambelli, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 22, 1984, Ser. No. 643,121
Int. Cl.[4] G03B 27/62
U.S. Cl. 355—75 4 Claims



1. In an electrophotographic document reproduction apparatus which includes a transparent document support platen and an optical projection system for projecting light images of said document from said platen to said photosensitive member, a document registration apparatus comprising:

at least one movable document registration guide associated with said platen, and

a pivotable platen cover assembly including mechanical engagement means for selectively engaging at least one of said registration guides whereby upon engagement, a pivoting movement of said cover conveys said registration guide into and out of optical alignment with the projection means.

4,577,961

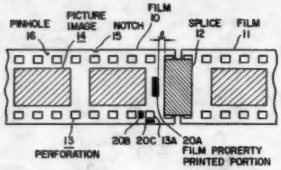
PHOTOMETRIC CONDITION CORRECTING METHOD FOR PHOTOGRAPHIC FILM

Takaaki Terashita, Kaisei, Japan, assignor to Fuji Photo Film Co., Ltd., Ashigara, Japan

Filed Oct. 25, 1983, Ser. No. 545,195
Claims priority, application Japan, Nov. 2, 1982, 57-192824
Int. Cl.[4] G03B 27/32
U.S. Cl. 355—77 9 Claims

1. A photometric condition correcting method of the type comprising measuring and analyzing B, G and R densities of a piece of photographic film and determining print exposure values therefrom comprising the steps of:

measuring the density of a portion printed in advance of a film by a film property printing means;
comparing the measuring value with a standard value;



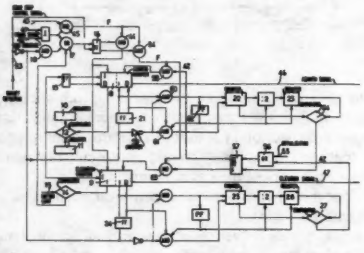
calculating correction values of sensitivity correction values and correction value of γ value for respective films; and correcting the photometric conditions on images of the film.

4,577,962

METHOD AND EQUIPMENT FOR THE CONTROL OF AIMING AND FIRING AT A REAL TARGET

Pièrre de Guillenschmidt, Neuilly S/Seine; Jacques Hubert, Asnieres; Michel Goujon, Chanteloup les V., and Christian Saunier, Ermont, all of France, assignors to Giravions Dorand, Suresnes, France

Continuation of Ser. No. 235,616, Feb. 19, 1981, abandoned. This application Oct. 6, 1983, Ser. No. 539,694
Claims priority, application France, Mar. 7, 1980, 80 05126
Int. Cl.[4] G01C *3/08;* G01B *11/26;* F41G *3/26*
U.S. Cl. 356—5 **8 Claims**



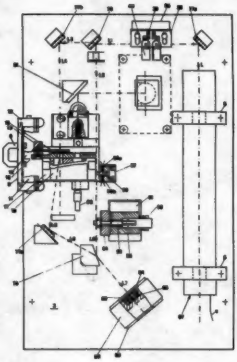
1. A method of fire control for firing at a real target comprising the steps of: associating a firing weapon with a laser radiation source and a detector sensitive to said radiation mounted in proximity to said weapon, automatically adjusting the orientation of the radiation from said source independently of the aiming of the weapon for continuous detection of the target as a result of detection of radiation by said detector after reflection from the target, determining said orientation and the time of transit of radiation between source and target, obtaining from said orientation and time of transit target data relating to the target position in elevation and azimuth, and to the target distance, and evaluating the result of a simulated shot by comparing said data quantitatively with the position of a simulated projectile along an expected trajectory, wherein said adjusting step comprises carrying out a first field scan by the radiation until detection of said radiation after reflection from the target, then tracking the target by a second field scan wherein the orientation of the radiation is maintained centered on the target during all target displacements.

4,577,963

APPARATUS TO EVALUATE OBJECTIVELY THE CONCENTRATION AND MOTILITY OF PARTICLES SUSPENDED IN A SAMPLE OF LIQUID WITH DATA PROCESSOR AND DISPLAY OF THE RESULTS

Vincenzo Traina, Via A. De Ferraris, 18/D - Bari, Italy (70124)

Filed Oct. 31, 1983, Ser. No. 547,394
Int. Cl.[4] G01P *3/36*
U.S. Cl. 356—28.5 **7 Claims**



1. An apparatus to evaluate objectively the concentration and motility of particles suspended in a liquid sample/samples examined sequentially by exploiting the Doppler effect, such apparatus comprising:

a box-container (1) wherein all the mechanical, electromechanical, optical component members as well as the component members of a data processor (100) are enclosed to examine sequentially one or more test-pieces and process the respective results;

a polarized LASER (87) energized through conductors (c) to emit a coherent monochromatic light beam (L) which is reflected, divided and/or refracted by means of a suitable optical system; in order that the favourable conditions for exploiting the Doppler effect may be realized;

an optical system comprising reflecting members (77*a*,77*b*, 77*c*), a divider (78) and a prism (79), so that the firstly reflected light beam (L1) is divided in two sub-beams (L2, L4), the former being a reference sub-beam (L2) the frequency of which is like the frequency (f_o) of the original beam (L) emitted by the LASER, while the latter is the sub-beam incident on the examining test-piece and influenced by the characteristics of same, so that a scattered light sub-beam (L5) is provided having a very near frequency (f) which is rejoined with reference sub-beam (L2) to finally provide a single rejoined beam (L7) the output signal of which is detected and amplifier by a photodetector (101) and processed by the data processor of the apparatus;

an electromechanical system to support and move a sample-holder (16) which is provided with a set of grooves to seat a respective set of test-pieces, the support (17) of sample-holder (16) being driven by a synchronous gear motor (94) in order that the test-pieces may be sequentially and automatically positioned for the examination in accordance with a previously programmed motion of support (17) and term of each examination through programming cards housed in a suitable card-holder (74,75,76) of box-container (1);

a data processor (100) to process and display the final results as alpha-numerical evaluations and/or graphic diagrams;

a monitor (90) to visually display the results;

a printing device (92) to display in a print form the results,

either as singly referred to each test-piece and/or on the whole;

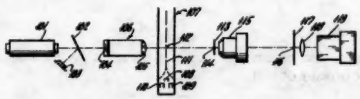
a keyboard (91) the keys of which are acted by the operator to carry out the operative phases of a sample examination.

4,577,964

APPARATUS AND METHOD FOR DETECTING PLATELETS IN WHOLE BLOOD

William P. Hansen, Jr., Middleborough, Mass., assignor to Ortho Diagnostics, Inc., Raritan, N.J.

Filed Sep. 6, 1978, Ser. No. 939,943
Int. Cl.[4] G01N *33/48, 21/00*
U.S. Cl. 356—39 11 Claims



1. A method of analyzing blood cells of a sample comprising:

(a) providing all cells to be analyzed through a predetermined area in a single sample stream analysis;

(b) illuminating respective blood cells in said sample by providing to said area focused illumination zone which dimensionally accommodates both red cells and platelets;

(c) detecting light scattered by cells in said zone to the exclusion of other light; and

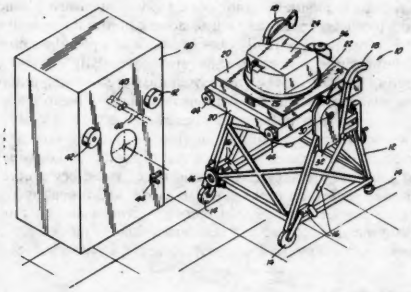
(d) discriminating platelets from red blood cells based on the parameters of cell volume and cell refractivity and duration of light so detected.

4,577,965

WEAPON SYSTEM TRANSPORTER

Clarence J. Russnak, Huntsville, Ala., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 30, 1983, Ser. No. 537,853
Int. Cl.[4] G01B *11/00*
U.S. Cl. 356—138 7 Claims



1. A weapon system transporter for receiving a unit under test thereon and releasable engagement to a test collimator used for testing the electro-optics of the unit under test, the transporter comprising:

a frame having wheels mounted thereon;

a frame housing mounted on top of the frame for receiving the unit under test thereon;

means for engaging the test collimator and holding the collimator to the transporter, the means for engaging mounted on the frame housing; and

alignment means mounted on the frame housing for aligning the axis of the unit under test with an orthogonal autocollimator in the test collimator.

4,577,966

SPECTROPHOTOMETER

Yoshiro Fukasawa, Tokyo, Japan, assignor to Japan Spectroscopic Co., Ltd., Hachioji, Japan

Filed Feb. 9, 1984, Ser. No. 578,758
Claims priority, application Japan, Feb. 12, 1983, 58-21949
Int. Cl.[4] G01J *3/08, 3/42*
U.S. Cl. 356—325 12 Claims

1. A double-beam spectrophotometer comprising

a source for emitting a beam of light,

a first sector for alternately distributing the beam from said source between reference and sample beam paths to form reference and sample beams, respectively,

reference and sample cells located in the reference and sample beam paths, respectively,

a second sector disposed substantially at the crossing of the reference and sample beam paths for guiding the reference and sample beams into a common beam path,

a monochromator disposed in the common beam path,

a detector located downstream of said monochromator for detecting the intensity of the monochromatic light from said monochromator, and

signal processing means electrically connected to said detector for processing an output signal of said detector,

wherein said first and second sectors are coordinated such that said detector receives from said monochromator the following eight light inputs (a) to (h):

(a) radiant light from the reference cell which does not receive the light beam from the source,

(b) radiant light from the sample cell which does not receive the light beam from the source,

(c) the light beam transmitted by the reference cell which receives the light beam from the source,

(d) the light beam transmitted by the sample cell which receives the light beam from the source,

(e) radiant light from the reference cell which does not receive the light beam from the source,

(f) the light beam transmitted by the sample cell which receives the light beam from the source,

(g) the light beam transmitted by the reference cell which receives the light beam from the source, and

(h) radiant light from the sample cell which does not receive the light beam from the source,

in this sequence with a phase difference of 45 degrees in one cycle, and

said signal processing means comprises

a first amplifier for amplifying that component of the output signal of said detector which has a frequency f corresponding to said cycle,

a first synchronous rectifier for synchronously rectifying the output of said first amplifier,

a second amplifier for amplifying that component of the output signal of said detector which has a frequency 2f twice the frequency f,

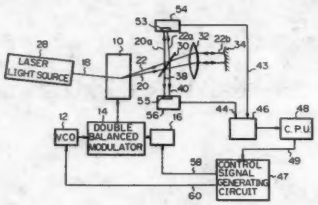
a second synchronous rectifier for synchronously rectifying the output of said second amplifier, and

divider means for computing the ratio of the output of said first rectifier to the output of said second rectifier.

4,577,967
SURFACE SHAPE MEASUREMENT APPARATUS

Hiroo Fujita, Tanashi, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed May 17, 1984, Ser. No. 611,062
Claims priority, application Japan, May 20, 1983, 58-88827; May 24, 1983, 58-90998
Int. Cl.[4] G01B 9/02
U.S. Cl. 356—349 10 Claims



1. A surface shape measurement apparatus for generating data representing the shape of a body surface, comprising:

scanning means for producing a probe light beam pair comprising first and second light beams mutually differing in frequency and for directing said light beams onto said surface, and for scanning said pair of light beams across a portion of said surface in a succession of steps of fixed amplitude;

phase detection means for sensing heterodyne interference between first and second reflected light beams from said surface resulting respectively from said first and second light beams incident thereon, to thereby producing during each of said scanning steps data representing a phase value which corresponds to a degree of phase difference between said first and second reflected light beams; and

data-processing circuit means operating on said phase values produced by said phase detection means to produce a set of phase measurement error values which respectively represent an amount of measurement error produced during each of said scanning steps and are in accordance with a phase error function, and for subtracting from each of said phase values produced by said phase detection means the corresponding one of said phase measurement error values to thereby derive a set of corrected phase values, and for performing integration of said set of corrected phase values to derive said data representing the shape of said surface.

4,577,968
METHOD AND ARRANGEMENT FOR OPTICAL DISTANCE MEASUREMENT

Günter Makosch, Sindelfingen, Fed. Rep. of Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

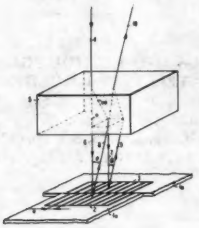
Continuation of Ser. No. 288,426, Jul. 30, 1981, abandoned. This application Jan. 24, 1985, Ser. No. 694,576
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1980, 80104529[U]
Int. Cl.[4] G01B 9/02
U.S. Cl. 356—356 11 Claims

1. A method for determining distances optically wherein the phase shift of two light beams upon diffraction from an optical grating is determined, comprising the steps of:

forming two perpendicularly polarized light beams,

directing said light beams to at least one optical grating associated with an object whose displacement is to be measured to cause a phase shift between two said light beams,

combining said light beams after diffraction from said optical grating, the light beams that are combined after striking said optical grating having the same diffraction order, and measuring said phase shift caused by diffraction from said

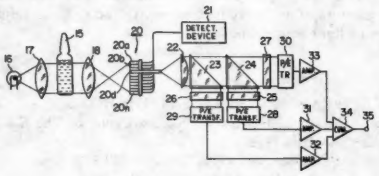


grating, said phase shift being a measure of the displacement of said object.

4,577,969
TESTING METHOD FOR SUBJECTS TO BE TESTED AND A DEVICE FOR SAID METHOD

Ryosaku Tagaya, Gunma, Japan, assignor to Eisai Co., Ltd., Tokyo, Japan

Filed Feb. 2, 1983, Ser. No. 463,107
Claims priority, application Japan, Jun. 3, 1982, 57-94012
Int. Cl.[4] G01B 11/00
U.S. Cl. 356—394 7 Claims



1. A testing method for testing a plural number of subjects comprising: sequentially and continuously measuring said subjects to obtain measured values, storing in plural respective memory circuits sequentially obtained ones of a plural number of said measured values as they are sequentially obtained, computing a mean value of the stored measured values, determining a standard value for judgement from said mean value, comparing the next obtained measured value with said standard value for judgement for judging, then using said next obtained measured value to replace one of the measured values stored in a said memory circuit, said mean value being computed after each such replacement is made, and repeating the foregoing steps to update said memory circuits and thereby vary said mean value and said standard value for judgement in correspondence to variation of subsequent measured values.

4,577,970
CUVETTE WITH INTEGRAL OPTICAL ELEMENTS

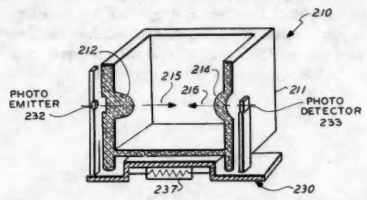
Peter M. Meserol, Montville, N.J., assignor to Personal Diagnostics, Inc., Whippany, N.J.

Filed Jul. 3, 1983, Ser. No. 512,119
Int. Cl.[4] G01N 21/00
U.S. Cl. 356—440 15 Claims

1. A molded cuvette with molded optical elements for use in photometric measurements, comprising:

molded transparent means providing a cell for receiving fluid undergoing change in optical characteristics which change modifies the energy level of a transluminating ray entering said transparent means, passing through and transluminating said fluid, and exiting said transparent means;

said molded transparent means provided with molded collimating lens for collimating said transluminating ray upon entering said transparent means and provided with molded collecting lens for collecting said transluminating



ray upon passing through said fluid and exiting said transparent means; and

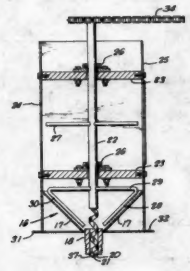
at least a portion of said molded transparent means and said molded collimating and said molded collecting lens molded together as a single unit.

4,577,971

BLENDING RUBBER FOR RETREADING

George R. Burcham, 104 E. Mohawk Dr., LaFollette, Tenn. 37766

Filed Jan. 12, 1983, Ser. No. 457,366
Int. Cl.⁴ B01F *15/04*
U.S. Cl. 366—76 **17 Claims**



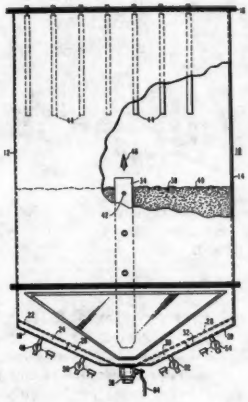
1. Retreading apparatus including means for blending reclaimed rubber buffing dust with tread rubber for tire retreading comprising a reteading unit, container means for holding said buffing dust, vertically orientated discharge pipe means from the container means for substantially directly discharging buffing dust from the container means into an upwardly directed mouth of hopper means, said hopper means being for receiving tread rubber in substantially ribbon form, auger means extending in the discharge pipe for meteringly expelling the buffing dust from the pipe predetermined by the rotational speed of the auger and the feed speed of the tread rubber into the hopper means, screw extruder means in the retreading unit for removing tread rubber and rubber dust from the hopper means and for effectively blending the tread rubber and buffing dust together thereby to provide a blended rubber product and means for winding said blended product on a tire casing to effect tire retreading.

4,577,972

SPOUTED BED BLENDER APPARATUS

David L. Shuck, Golden, Colo., and Irving E. Knudsen, Murrysville, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 197,320, Oct. 15, 1980, abandoned.
This application Oct. 19, 1982, Ser. No. 435,167
Int. Cl.⁴ B01F *13/02*
U.S. Cl. 366—101 **5 Claims**



1. In a blender apparatus for homogenizing at least two nuclear fuel powder material, the combination of

container means for holding a bed of said nuclear fuel powder materials,

first shear producing means including a draft tube positioned vertically within said container means and including a gas stream for transporting powder material through said tube from the bottom of said bed in a first direction toward the top of said bed,

diverter means positioned within said container means and located in relation to the top of said draft tube for diverting the resultant powder and gas stream produced by said first shear producing means onto the top of said bed, and

second shear producing means positioned within the container means and operated relative to said first shear producing means for increasing the velocity of some portion of the powder material within said draft tube in a second direction different than said first direction for the purpose of breaking up agglomerates of powder material within said draft tube thereby improving both the rate and extent of powder material homogeneity.

4,577,973

METHOD AND DEVICE FOR MIXING UNDER VACUUM MIXTURES USED IN DENTAL, GOLDSMITH FIELDS OR THE LIKE

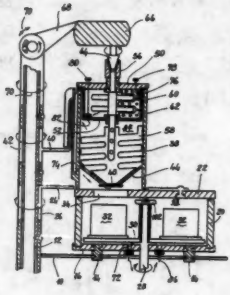
Luciano Occelli, Via Solari 52, Milan, Italy (20144)

Filed Feb. 14, 1984, Ser. No. 580,556
Claims priority, application Italy, Feb. 24, 1983, 19725 A/83
Int. Cl.⁴ B01F *13/06*
U.S. Cl. 366—139 **14 Claims**

1. A method for forming under a vacuum a mixture of a powder and a liquid, intended to be admitted into containers for the subsequent production of molds in the dental or goldsmith fields or the like, said method comprising:

individually degassing the liquid and powder components of the mixture in separate respective liquid and powder

vessels under vacuum before mixing said liquid and powder components; and



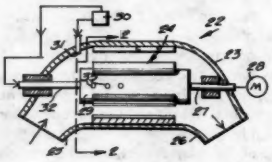
then combining said liquid and powder components and subjecting them to a mixing operation, while maintaining vacuum conditions.

4,577,974

MEDIUM CONSISTENCY MIXER ROTOR AND STATOR CONSTRUCTION

J. Robert Prough, and Louis O. Torregrossa, both of Glens Falls, N.Y., assignors to Kamyr, Inc., Glens Falls, N.Y.

Filed May 4, 1984, Ser. No. 607,309
Int. Cl.[4] B01F 7/02
U.S. Cl. 366—307 **11 Claims**



1. Apparatus for continuously mixing fluid into a fibrous suspension, comprising:

a housing having a first, generally circular cross-section portion, with an inlet to, and an outlet from, said housing;

a shaft mounted for rotation within said housing substantially along the center of the first portion thereof;

a rotor rotatable with said shaft, including a plurality of fluidizing axially extending, and radially upstanding ribs, said rotor, including said ribs, having a diameter smaller than said housing first portion diameter;

means for introducing fluid into fibrous suspension within said housing, adjacent said rotor;

means for effecting rotation of said shaft about said axis to effect fluidization of suspension acted upon by said rotor;

wherein each of said ribs comprises a first, generally radially extending, side wall; a second side wall being generally tangent to said rotor, and being disposed on the opposite side of said rib as said first wall; and a substantially flat top; and wherein said first side of each rib is closest to the second side of a circumferentially adjacent rib, and vice versa;

a plurality of axially extending, radially inwardly extending stationary ribs formed on the inner surface of said housing at said first portion of said housing, said stationary ribs being radially spaced from said rotor ribs; and

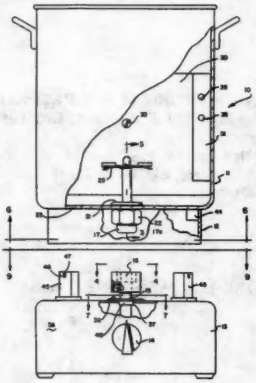
wherein each of said stationary ribs comprises: a generally flat radially innermost surface; a first, generally radially extending, side wall; and a second side wall, opposite said first side wall, said second side wall sloping gradually from said rib top to an inner surface of said housing; and wherein said first side wall of each of said stationary ribs is closest to the second side wall of a circumferentially adjacent stationary rib, and vice versa; and wherein when a rib of said rotor is in radial alignment with one of said stationary ribs, said first side wall of said rotor rib is in alignment with said second side wall of said stationary rib, and said second side wall of said rotor rib is in alignment with said first side wall of said stationary rib.

4,577,975

MIXING AND BLENDING APPARATUS

Carl E. McCrory, West Covina, and Herbert G. Hall, Calabasas, both of Calif., assignors to Carl McCrory Enterprises, Inc., West Covina, Calif.

Continuation-in-part of Ser. No. 608,641, May 9, 1984, abandoned. This application Sep. 14, 1984, Ser. No. 650,278
Int. Cl.[4] B01F 7/10
U.S. Cl. 366—314 **12 Claims**



1. A mixer for liquids comprising:

a. a container;

b. impeller means mounted in said container for rotation and comprising rotatable impeller blade means for imparting rotational motion with respect to the axis of said impeller to a mixable material in contact therewith;

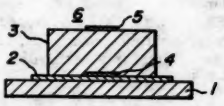
c. a motor base having a casing and rotatable drive shaft means adapted to couple with connecting means to rotate said impeller when said container is mounted on said motor base, said drive shaft means extending upwardly from said motor base through an opening in said casing and said drive shaft having a generally circular cross-section and a flattened portion extending on one side thereof; and

d. a disk means fixed to said drive shaft to rotate therewith above said opening, said disk extending radially outwardly over said opening whereby liquid contacting the upper surface of said disk will be spun off as said disk is rotated said disk having an opening extending therethrough of a corresponding cross-section through which said drive shaft extends whereby said disk can be fitted on said drive shaft in fixed liquid sealing engagement to rotate with said drive shaft.

4,577,976
MULTI-LAYERED THIN FILM HEAT TRANSFER GAUGE

Masanori Hayashi; Akira Sakurai, and Shigeru Aso, all of Fukuoka, Japan, assignors to Kyushu University, Fukuoka, Japan

Filed Oct. 19, 1984, Ser. No. 662,899
Claims priority, application Japan, Mar. 27, 1984, 59-57426
Int. Cl.[4] G01K *17/00*
U.S. Cl. 374—29 **2 Claims**



1. A multi-layered heat transfer gauge, comprising

a heat resistive thin film having a heat conductivity κ and a thickness L between upper and lower opposite surfaces;

a first metallic thin film having a resistance r_1 and a temperature coefficient of resistance a_1 bonded to the upper surface of said heat resistive thin film and a second metallic thin film having a resistance r_2 and a temperature coefficient of resistance a_2 bonded to the lower surface of said heat resistive thin film; and

measuring means for measuring the temperature gradient across said heat resistive thin film, said measuring means including

a first resistor R_1 connected in series with said first metallic thin film to form a first series circuit;

a second resistor R_2 connected in series with said second metallic thin film to form a second series circuit; and

third and fourth resistor R_S and r_s respectively connected in series to form a third series circuit, said first, second and third series circuits being connected in parallel, a voltage V being connected across the parallel connection of said first, second and third series circuits, a voltage e_1 being generated at the connection of said first resistor and said first metallic thin film, a voltage e_2 being generated at the connection of said second resistor and said second metallic thin film and a voltage e_0 being generated at the connection of said third and fourth resistors, whereby the heat flux qw entering said heat resistive thin film is given by the equation:

$$qw=\gamma(\epsilon_{12}+\delta\cdot\epsilon_{20}),$$

where

$\epsilon_{12}=(e_1-e_2)/V$

$\epsilon_{20}=(e_2-e_0)/V$

$\delta=(a_2-a_1)/a_2$; and

$\gamma=(\kappa/L)\cdot(1/a_1)\cdot(m+1)^2/m$, where

$m=R_S/r_s$.

4,577,977
ENERGY SUBMETERING SYSTEM

Jane H. Pejsa, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 1, 1985, Ser. No. 718,146
Int. Cl.[4] G01K *17/08*
U.S. Cl. 374—39 **5 Claims**

1. A method for submetering artificial energy consumption in a multi-user environment in which a central source services a plurality of individual users by means of individual space conditioning subsystems comprising the steps of:

monitoring the time interval of the OFF segment and the time interval of the entire OFF/ON cycle for each cycle of each individual space conditioning subsystem;

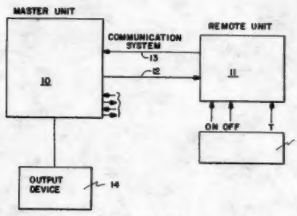
monitoring the temperature of each conditioned space to determine temperature decay function during the OFF segment and the actual space temperature at the conclusion of each OFF/ON cycle for each cycle of each individual space conditioning means;

determining the total artificial heating or cooling energy supplied by each such individual space conditioning subsystem during each complete OFF/ON cycle according to the relationship

$$Q=MC(T_2-T_{est})$$

wherein:

Q is the artificial heating or cooling energy;



$\overline{MC}$ is the relative heat capacity of the conditioned space;

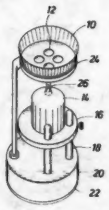
T_2 is the conditioned space temperature at the conclusion of the ON segment of the control cycle; and

T_{est} is the theoretical extrapolated decay temperature at the end of the complete OFF/ON cycle; and utilizing the total artificial energy supplied by each individual space conditioning subsystem to determine the heat consumption of each such subsystem relative to all such subsystems served by said central source as a fraction of the total thereof.

4,577,978
FIELD TEST FOR DETERMINING WATER IN OIL

Julian R. Schneider, and Gene A. Pullen, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 22, 1984, Ser. No. 663,293
Int. Cl.[4] G01N *25/00, 25/10*
U.S. Cl. 374—45 **5 Claims**



1. A rapid field method for determining small amounts of water in industrial and lubricating oils which comprises:

placing a measured sample of a test oil in one or more compartments of a suitable heating container;

placing an equal amount of a reference oil containing a known quantity of water in one or more additional compartments of said heating container;

heating said container rapidly to heat said test oil and said reference oil and to thereby increase the temperature of said reference oil and said test oil to approximately equal temperatures and to generate a quantity of bubbles rising through said reference oil and said test oil; and

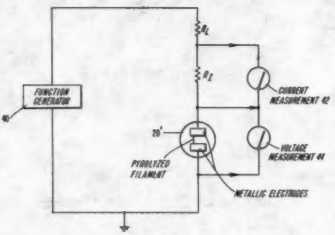
observing said quantity of bubbles generated in said test oil and said reference oil to provide a relative indication of the amount of water in said test oil.

4,577,979

ELECTRICAL TEMPERATURE PYROLYZED POLYMER MATERIAL DETECTOR AND ASSOCIATED CIRCUITRY

Ilmar L. Kalnin, Millington; Harris A. Goldberg, Colonia, and Clyde C. Williams, Roselle, all of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Apr. 21, 1983, Ser. No. 487,378
Int. Cl.[4] G01K *11/16;* H01L *49/00*
U.S. Cl. 374—178 14 Claims



1. An ambient temperature detector comprising:

at least one filament of partially pyrolyzed organic polymer material connected between two spaced electrical terminals, said material exhibiting switching to a negative resistance portion of a voltage-current domain upon attaining a voltage, V_{BO}, wherein said switching voltage, V_{BO}, varies with the temperature of the material; and

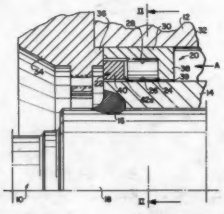
means for detecting a shift in the at least one filament from a higher resistance to a lower resistance, including means for applying a voltage across said two terminals, wherein the ambient temperature is at least 300° C. below a maximum pyrolysis temperature of the at least one filament.

4,577,980

ANTI-FRICTION BEARING UNIT OF A SYNTHETIC RESIN PROCESSING MACHINE

Erich Weichenrieder, Egling-Neukolbing, Fed. Rep. of Germany, assignor to Recycloplast AG, Egling-Neukolbing, Fed. Rep. of Germany

Filed Jul. 24, 1984, Ser. No. 634,084
Claims priority, application Fed. Rep. of Germany, Jul. 27, 1983, 3327132
Int. Cl.[4] F16C *19/26, 33/46, 33/66, 33/80*
U.S. Cl. 384—488 9 Claims



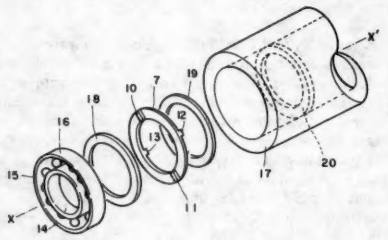
1. An anti-friction bearing unit, positioned in a housing and placed around a shaft, for a synthetic resin processing machine comprising; means defining an inner and outer bearing running face having a radial space between said faces, said means positioned between said housing and said shaft, rolling bodies placed in said radial space, said rolling bodies running on said inner and outer bearing running faces, a cage placed in said radial space, adjacent to said rolling bodies, for selective circumferential spacing of said rolling bodies around said shaft, means for substantially shutting off resin flow into said radial space, said means for shutting off resin flow positioned adjacent to said rolling bodies and facing toward said machine's inside chamber, a small gap positioned between said shut-off means and said shaft for providing resin flow into said radial space for lubricating said rolling bodies when said machine is at working temperature.

4,577,981

SPINDLE DEVICE

Quanbee Kimura, Kawasaki, Japan, assignor to Yoshizuka Seiki Co., Ltd., Japan

Filed Jun. 12, 1984, Ser. No. 620,043
Claims priority, application Japan, Jun. 21, 1983, 58-111631
Int. Cl.[4] F16C *23/08*
U.S. Cl. 384—495 4 Claims



1. In a spindle device comprising a shaft having an output mounting portion in a front end thereof, a pair of bearings for supporting the shaft on front and rear side portions thereof and arranged at a certain distance from one another, each bearing including an inner race in which said shaft is mounted, an outer race, and rolling elements between said inner and outer races, a housing having a bore through which the shaft axially extends, a pair of bearing mounting counter bores in which the respective bearings are coaxially slip-fitted, and a spring for applying a pre-load to said bearings, the improvement comprising

a ring member having a pair of opposite side surfaces,

a pair of first projections extending from one of said side surfaces and situated at substantially diametrically opposite positions, and

a pair of second projections extending from the other one of said side surfaces and situated at substantially diametrically opposite positions,

said second projections being shifted substantially 90° with respect to said first projections,

a shoulder provided in said bearing mounting counter bore having a surface in opposed relationship to said outer race of said front side bearing, and

said ring member being situated in said bearing mounting counter bore between said outer race of said front side bearing and said shoulder surface of said bearing mounting counter bore.

4,577,982

RECORDING APPARATUS

Ryoichi Sasaki, Nagoya, Japan, assignor to Brother Industries, Ltd., Nagoya, Japan

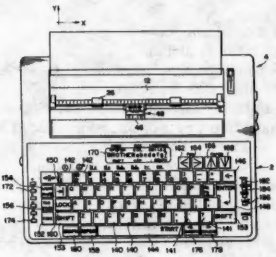
Filed Mar. 18, 1985, Ser. No. 713,005
Claims priority, application Japan, Mar. 26, 1984, 59-58586
Int. Cl.[4] B41J *3/04*
U.S. Cl. 400—17 2 Claims

1. A recording apparatus comprising:

(a) a keyboard comprising a multiplicity of character and symbol keys corresponding to various kinds of characters and symbols, and a plurality of functional keys;

(b) a paper feeding device for supporting a recording paper and feeding same in the usual direction and also the opposite direction;

(c) a carriage for supporting writing instruments movable in a direction perpendicular to the direction in which the recording paper is fed;
(d) A carriage drive means for driving the carriage;
(e) a writing instrument drive means for driving each said writing instrument to bring same into and out of contact with the recording paper;
(f) a character and symbol pattern memory for storing character symbol pattern data; and
(g) a control unit operative for reading out, as said character and symbol key are actuated, the character and symbol pattern data corresponding to the actuated character and symbol keys and controlling the operation of the paper feeding device, carriage drive means and writing instrument drive means in accordance with the read-out character and symbol patten data;
wherein the improvement comprises:



(h) a recorded posture command key located in the keyboard for giving instructions to the recording control unit as to whether the characters and symbols are to be recorded on the recording paper in an upright position or in a lying position;
(i) a writing instrument position memory for storing the position in which the writing instrument is located on the recording paper when the recorded posture is switched from the upright position to the lying position by actuating the recorded posture command key; and
(j) a writing instrument restoring means operative, when the recorded posture is switched from the lying position back to the upright position by actuating the recorded posture command key, to restore the writing instrument to the position on the recording paper which is stored in the writing instrument position memory.

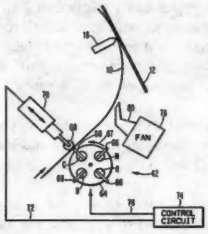
4,577,983

COLOR-ON-DEMAND RIBBON PRINTING

Ari Aviram, Yorktown Heights; Derek B. Dove, Mount Kisco, and Ramon Lane, Crompond, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1984, Ser. No. 626,162
Int. Cl.[4] B41J *3/20, 35/18*
U.S. Cl. 400—120 **8 Claims**

1. A color-on-demand resistive ribbon printing apparatus including in combination:
a ribbon including a resistive layer and having a fusible ink layer thereon, said ink layer including all of the ink components with the exception of a desired colorant,
color means for applying said desired colorant to said fusible ink layer, said color means being located between a supply reel supplying said ribbon and a printing head for melting said fusible ink layer, said color means containing a colorant solution and a transfer means for transferring said colorant solution to said ribbon, said color means further including contact means for contacting said ribbon and said transfer means to transfer said colorant solution to said fusible ink layer on said ribbon, and



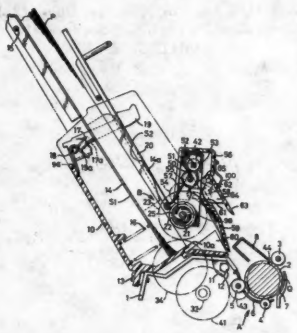
said printing head including a plurality of electrical current carrying styli for printing onto a receiving medium colored indicia using said colored ribbon.

4,577,984

PAPER FEEDING DEVICE FOR A PRINTING APPARATUS PROVIDING ALTERNATIVELY DIFFERENT FEED PATHS

Takemi Yamamoto; Susumu Kuzuya; Isao Kagami, and Yuuichi Takenaka, all of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Oct. 13, 1983, Ser. No. 541,419
Claims priority, application Japan, Dec. 7, 1982, 57-214315; Dec. 13, 1982, 57-188769[U]
Int. Cl.[4] B41J *13/10*
U.S. Cl. 400—625 **19 Claims**



1. A paper feeding device for a printer having a printing assembly, which comprises:
a frame secured to said printer;
a first paper handling assembly supported by said frame and having a first paper stacker for storing sheets of paper of one kind and paper feeding means for feeding said sheets of paper of one kind from said first paper stacker along a first paper inlet path to said printing assembly;
a second paper handling assembly having ejection rollers and a second paper stacker for receiving said sheets of paper of one kind through said ejection rollers after said sheets of paper of one kind are printed by said printing assembly;
a sub-frame supporting said ejection rollers and retained by said frame pivotally between a first position and a second position;
at least one paper guide pivotally supported by said sub-frame;
paper guide actuating means for pivoting said at least one paper guide between a first position and a second position

according to the pivotal movement of said sub-frame between said first position and said second position, said at least one paper guide defining, when placed in its first position, a paper exit path opening to guide the printed sheets of paper of said one kind from said first paper stacker toward said second paper stacker, said at least one paper guide closing said paper exit path opening when said at least one paper guide is placed in its second position; and

means for defining a second paper inlet path adjacent to said second paper handling assembly and leading to said printing assembly when said sub-frame is placed in said second position thereof,

whereby sheets of paper of another kind different from said one kind are loaded to said printing assembly along said second paper inlet path when said sub-frame is placed in its second position, and the printed sheets of paper of said another kind are prevented from being received in said second paper stacker.

4,577,985

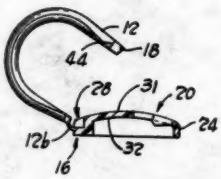
RING BINDER

Lewis R. Beyer, P.O. Box 416, Hinckley, Ohio 44233

Filed Dec. 29, 1983, Ser. No. 566,917

Int. Cl.⁴ B42F *3/02, 13/02*

U.S. Cl. 402—22 **3 Claims**



1. A ring binder comprising:

an elongated backplate having a convex top surface facing away from a spine of a binder a concave wall surface facing toward said spine and futher comprising first and second longitudinal edges defining a base surface;

a plurality of elongated binder ring elements with one end integrally hinged along the first longitudinal edge of said backplate, said ring elements extending outward from said top surface to a free end with flanged sides;

said backplate defining apertures, one for each ring element, transversely aligned with the right elements across said backplate and having a wide portion to receive said free end, a narrow portion adjacent the second longitudinal edge of said backplate narrower than the flanged end of said ring elements, and a neck portion intermediate the wide and narrow portions;

said wall surface defining a planar camming surface angled from said second edge toward, said back surface along said narrow portion to inhibit movement of said flanged end along the wall surface past the neck portion to said wide portion.

4,577,986

JOINT MECHANISM FOR FOLDING LADDERS, FURNITURE AND THE LIKE

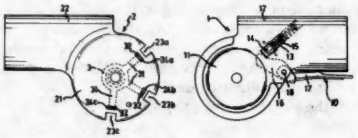
Chien-Yuan Wang, No. 17, Alley 6, Lane 24, Pa Te Rd., Sec. 4, Taipei, Taiwan

Filed Sep. 14, 1983, Ser. No. 532,096

Claims priority, application Japan, Jan. 20, 1983, 58-007041[U]

Int. Cl.⁴ F16C *11/00;* E05D *11/10*

U.S. Cl. 403—93 **4 Claims**



1. A joint mechanism comprising:

a first joint member including

a disk-shaped portion comprising a pair of opposing, spaced apart disk members,

a tubular portion extending from said disk-shaped portion and including a pair of opposing, spaced apart sides in each of which is formed a slot,

a pawl slidably supported in said slots,

spring means for biasing said pawl in a first direction,

a pivotable operating lever including a manually actuable handle portion and a pawl-actuating portion engageable with said pawl when said handle portion is actuated, for pushing said pawl opposite said first direction against the bias of said spring,

a second joint member mounted to said first joint member for relative rotation about an axis of rotation, said second joint member comprising

a hollow locking disk element including a plurality of circumferentially spaced notches on its outer periphery, said disk element disposed between said disk members and being connected thereto by a pivot pin defining said axis of rotation, said pivot pin extending centrally through said disk element and said disk members such that relative rotation between said disk element and said disk members sequentially orients said pawl in alignment with said notches, said disk element including a plurality of slits situated adjacent respective ones of said notches and extending through said disk element,

a control member mounted on said disk element and including a plurality of fingers projecting through respective ones of said slits so as to emerge beyond a side of said disk element, each of said fingers including a stop surface and a cammable surface, said stop surface being engageable with said lever when said pawl approaches the associated notch from a first direction, to block movement of said pawl into such notch, said cammable surface being engageable with said lever when said pawl approaches the associated notch from a second direction such that said finger is cammed into its slit to permit the pawl to enter the respective notch, and

a tubular portion extending from said disk element.

4,577,987

BALL AND SOCKET JOINT

Reihard Buhl, Bohmte, and Paul Westphal, Lemförde, both of Fed. Rep. of Germany, assignors to Lemförder Metallwaren AG, Fed. Rep. of Germany

Filed Apr. 25, 1984, Ser. No. 603,589

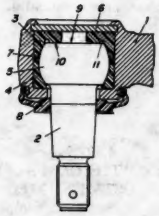
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1983, 3315658

Int. Cl.⁴ F16C *11/06*

U.S. Cl. 403—133 **4 Claims**

1. A ball and socket joint, particularly a track rod joint for

motor vehicles, comprising a hollow cylindrical casing having an opening at one end and having an opposite end, a ball stud having a spherical ball head located within said casing and having a flat polar top surface adjacent the opposite end of said casing, a ring-shaped socket member having an annular portion engaged around a portion of said spherical ball head and having a top end portion overlying the flat polar top surface of said



ball stud, and a cover engaged peripherally against the interior of said casing and held by said casing into compressive engagement with said end portion, said ring-shaped socket member forming an annular thrust area radially spaced from said annular portion and extending axially from said end portion and with a free end substantially parallel to said cover and kept under biasing load by said cover.

4,577,988

BALL JOINT

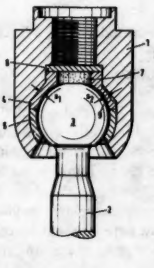
Erwin Gollub, Neuss, and Reinhardt Muller, Krefeld, both of Fed. Rep. of Germany, assignors to TRW Ehrenreich GmbH & Co., KG, Dusseldorf, Fed. Rep. of Germany

Filed Jul. 26, 1984, Ser. No. 634,709

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1983, 3326960

Int. Cl.⁴ F16C *11/00*

U.S. Cl. 403—140 **3 Claims**



1. A ball joint comprising:

a housing,

a ball stud having a ball head disposed in said housing,

two substantially semispherical bearing shells interposed between said housing and said ball head, one of said bearing shells being composed of a soft elastic material and the other of said bearing shells being composed of a hard elastic material,

said bearing shells having inner surfaces at least partially engaging said ball head,

said one bearing shell having ridges formed on an outer surface thereof and elastically engaging the wall of said housing, and

the wall thickness of said one bearing shell in zones between said ridges being one half or less than the wall thickness of said one shell in zones of said ridges so that lubricant pockets are formed between the inner surface of said one shell and said ball head in the zones between said ridges when said ridges elastically engage the wall of said housing upon initial preloading thereof.

4,577,989

BALL JOINT

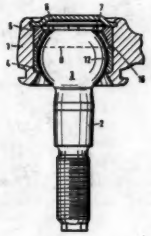
Elichi Ito, Meerbusch, Fed. Rep. of Germany, assignor to TRW Ehrenreich GmbH & Co. KG, Dusseldorf, Fed. Rep. of Germany

Filed Jun. 25, 1984, Ser. No. 624,300

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1983, 3326586

Int. Cl.⁴ F16C *11/06*

U.S. Cl. 403—140 **3 Claims**



1. A ball joint for a vehicle comprising:

a housing for receiving a ball head,

a bearing insert disposed between said housing and said ball head, said bearing insert having a body portion engaging said ball head on one side of the equatorial plane thereof and axially extending tongues defining slots therebetween and gripping said ball head on the other side of the equatorial plane thereof, and

a clamping ring supported in said housing in surrounding relationship with respect to said tongues,

the inner surface of said clamping ring and the outer surface of said tongues defining complimentary conical surfaces,

said clamping ring having circumferentially extending grooves on the inner surface thereof and axially extending projections in the form of annular segments on the outer surface thereof engaging said housing to thereby provide for prestressing said ball joint.

4,577,990

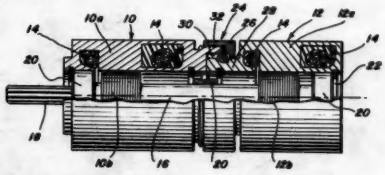
COAXIAL COUPLING AND LOCKING MECHANISM

Richard K. Carlson, Wilmette, Ill., assignor to MPC Products Corporation, Skokie, Ill.

Division of Ser. No. 381,950, May 26, 1982, Pat. No. 4,430,632. This application Jan. 26, 1984, Ser. No. 559,978

Int. Cl.⁴ B25G *3/00*; F16B *7/18*

U.S. Cl. 403—342 **9 Claims**



1. In a coaxial coupling assembly which includes a pair of axially aligned coupling members interengaged and drawn together by a rotatable coupling ring, means for permanently locking said coupling members against rotation after being drawn together by the coupling ring, comprising an annular

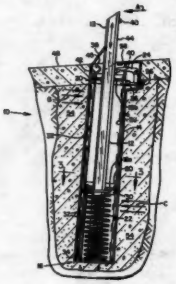
locking member sandwiched between and generally axially abutting said coupling ring and each of said coupling members.

4,577,991

DEPLOYABLE VEHICULAR BARRICADE

Willard J. Rolow, Rte. 3, Box 350, Alsea, Oreg. 97324

Filed Nov. 28, 1984, Ser. No. 675,726
Int. Cl.[4] E01F *13/00*
U.S. Cl. 404—6 9 Claims



1. A deployable vehicle barricade apparatus for resisting and absorbing vehicular impact comprising:

(a) an elongate rigid post having two ends, a top end and bottom end;

(b) elongate rigid tubular casing means for receiving said post, said casing means having an inner surface and an outer surface;

(c) propellant means for rapidly causing an upper portion of said post proximate said top end to extend beyond said casing means;

(d) brace means cooperating between said post and said inner surface of said tubular casing means for resisting and transferring the force of a vehicular impact upon said upper portion of said post to said casing means; and

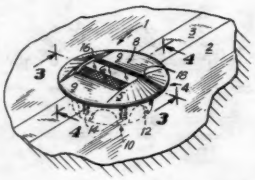
(e) said brace means including at least two spaced-apart brace elements, each of said brace elements cooperating between said post and said inner surface of said casing means to transfer said force to said casing means, said brace elements spaced apart a distance greater than one-half the length of said post.

4,577,992

SNOWPLOWABLE ROAD MARKER APPARATUS

George S. Jefferies, 413 Nassau Ave., Freeport, N.Y. 11520

Filed Aug. 31, 1984, Ser. No. 645,874
Int. Cl.[4] E01F *9/06*
U.S. Cl. 404—16 19 Claims



1. A snowplowable road marker apparatus securable in a pre-formed opening in road material without the use of adhesive comprising:

an outwardly dished top section having a relieved elongated channel extending across said top section with said channel being adapted to receive therein an indicator means;

a bottom section with means connected to a bottom surface of said top section having a plurality of spaced apart gripping means disposed on an outside surface of said bottom section with said bottom section being adapted to be fixably disposed in road material of a road; and

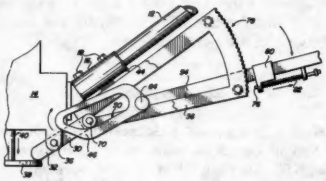
said indicator means with means connected to at least one surface of said channel for indicating the position of said marker apparatus.

4,577,993

POWER TROWEL WITH CAM-ACTUATED BLADE PITCH ADJUSTMENT MECHANISM

J. Dewayne Allen, and Edward F. Randolph, both of Paragould, Ark., assignors to Allen Engineering Corporation, Paragould, Ark.

Filed Feb. 22, 1985, Ser. No. 704,379
Int. Cl.[4] E01C *19/22*
U.S. Cl. 404—112 16 Claims



1. A power trowel having a cam-actuated blade pitch adjustment mechanism, comprising:

a. a trowel frame;

b. an engine coupled to said frame and including an output shaft;

c. a set of blades rotated within a fixed plane by the output shaft of said engine;

d. a blade pitch control unit for controlling the pitch of said blades;

e. a handle having a first end coupled to said trowel frame and a second end laterally spaced apart from said trowel and elevated above the plane of said blades;

f. said blade pitch control unit including

i. a swash plate;

ii. a swash plate actuator arm having an inboard end engaging said swash plate and an outboard end;

iii a pivot pin for pivotally coupling said actuator arm to said trowel;

g. means for displacing the outboard end of said swash plate actuator arm, including

i. a support bracket coupled to said trowel frame in proximity to said actuator arm;

ii. a fixed stud secured to and extending laterally outward from said bracket;

iii. a moveable stud extending laterally outward from the outboard end of said actuator arm;

iv. a cam rotatably coupled to said fixed stud and including a camming surface engaging said moveable stud; and

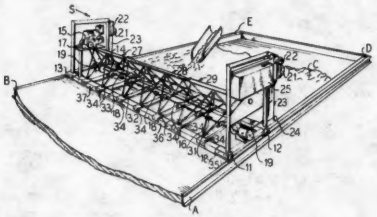
v. means for rotating said cam in first and second directions about said fixed stud to cause said camming surface to alternately displace said moveable stud and said actuator arm in first and second directions to thereby alternately increase or decrease the pitch of said trowel blades.

4,577,994

VIBRATORY CONCRETE SCREED

Thomas E. Miller, Mequon, Wis., assignor to Metal Forms Corporation, Milwaukee, Wis.

Continuation of Ser. No. 336,307, Dec. 31, 1981, abandoned.
This application May 29, 1984, Ser. No. 615,696
Int. Cl.[4] E01C *19/40*
U.S. Cl. 404—114 2 Claims



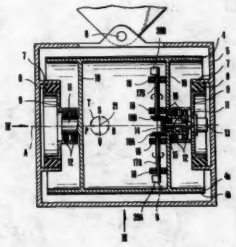
1. Screed apparatus comprising:
an elongate frame adapted for movement along a pair of spaced side forms;
a pair of screed bars mounted on said frame spaced apart in the direction of movement and extending transversely to the direction of movement, each of said screed bars comprising first and second opposed sides; and
mounting means for releasably mounted said screed bars at points of attachment to said frame such that either of said first and second opposed sides may be oriented for contact with the concrete.

4,577,995

MECHANISM FOR GENERATING VIBRATIONS FOR A GROUND COMPACTING MACHINE

Hisanori Sadahiro, Kawagoe, Japan, assignor to Sakai Heavy Industries Ltd., Tokyo, Japan

Filed Apr. 3, 1984, Ser. No. 596,278
Claims priority, application Japan, Apr. 7, 1983, 58-61408
Int. Cl.[4] E01C *19/38*
U.S. Cl. 404—117 6 Claims



1. In a mechanism for generating vibrations for a ground compacting machine of the type including a rolling wheel, the improvement consisting in that at least one rotary shaft with an eccentric mass fixedly mounted thereon is rotatably supported in the rolling wheel in such a manner that the center line of rotation of said rotary shaft is located on a linear line extending in parallel with the radial direction relative to the center line of rotation of the rolling wheel whereby the ground contact portion on the rolling wheel is vibrated in the horizontal plane by rotating the rotary shaft for the eccentric mass.

4,577,996

METHOD OF CONTROLLING AQUATIC PLANT GROWTH AND SILICONE RUBBER BENTHIC BARRIERS

Michael G. Elias, Mayfield Heights, Ohio, and George D. Pullman, Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Jul. 10, 1984, Ser. No. 628,942
Int. Cl.[4] E02B *3/00*
U.S. Cl. 405—17 4 Claims

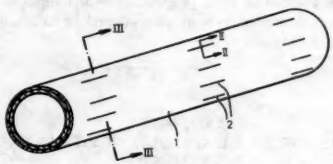
1. A method for controlling the growth of aquatic plants in a body of water which is exposed to sunlight comprising depositing on the surface of the body of water over the location where plant life is to be controlled, a benthic barrier which comprises a fabric coated on at least one side with silicone rubber thick enough to prevent root penetration and thin enough to allow gases forming below the barrier to pass through the coating and escape, said silicone rubber comprising crosslinked polyorganosiloxane and filler which blocks the passage of light through the barrier to the bottom of the body of water and raises the specific gravity above 1.0 to a value which allows the barrier to readily settle to the bottom where it covers the aquatic plants or the bottom on which aquatic plant growth is to be prohibited, after the barrier is placed on the water surface, it settles to the bottom and is anchored as necessary to avoid displacement by turbulence in the body of water.

4,577,997

IRRIGATION PIPE

Eino Lehto, Linnankatu 53 F 224, 20100 Turku 10, Finland; Göran Möller, Enrisvägen 16, 14144 Huddinge, Sweden, and Lasse Sjövall, Hämeenkatu 5 A 10, 20500 Turku 50, Finland

Filed Jul. 7, 1983, Ser. No. 511,793
Claims priority, application Finland, Jul. 7, 1982, 822376
Int. Cl.[4] E02B *3/00*
U.S. Cl. 405—43 2 Claims



1. A method of irrigation which comprises the steps of:
forming a two-layer irrigating pipe by
producing a hot tubular first layer of polyethylene plastic,
allowing said first layer to cool,
then applying a second layer of polyethylene plastic so that it completely ensheathes said first layer in continuous contact with said first layer uniformly all around the periphery thereof and with a thickness less than that of said first layer but such that material of said second layer does not blend with material of the first layer, and
incising through both said layers with parallel incisions extending longitudinally of the pipe and uniformly spaced apart all around the circumference of the both layers and spaced apart along the length of the resulting pipe;
burying said pipe in a region irrigated; and
passing irrigating water under pressure through said pipe, thereby widening said incision outwardly and permitting water to flow outwardly through the outwardly widened incisions.

4,577,998

PRODUCTION OF PVC IRRIGATION PIPE AND THE PIPE SO PRODUCED

Clive Dorrn, Bedfordshire, England, assignor to Imperial Chemical Industries, PLC, London, England

Filed Oct. 4, 1982, Ser. No. 432,675

Claims priority, application United Kingdom, Oct. 22, 1981, 8131949

Int. Cl.[4] A01G *25/02;* B29C *67/22, 55/22*

U.S. Cl. 405—45 9 Claims

1. A process for producing water-permeable flexible PVC pipe suitable for irrigation applications which process comprises extruding a plasticised PVC composition, containing a melt strength-enhancing aid and a chemical blowing agent system, using an extruder equipped with a pipe-forming die, wherein said extrusion comprises

(a) the extruded melt being expanded by foaming thereof immediately on leaving the die into a substantially closed-cell extrudate of greater outer diameter than the outer diameter of the die exit orifice with the surfaces of the extrudate being substantially unpunctured, said expansion being into the surrounding atmosphere,

(b) drawing down the extrudate in the atmosphere causing rupturing of the foam cell walls of the extrudate to form a substantially open-cell extrudate having punctured surfaces, and

(c) when the extrudate has been drawn down in the atmosphere to a degree which is prior to any cellular collapse which would lead to the formation of substantially water-impervious pipe, cooling the extrudate by passing it through a cooling means in order to prevent said collapse.

7. A water-permeable PVC pipe suitable for irrigation purposes which is produced by a process according to claim 1.

4,577,999

PROCESS FOR STORING LIQUID WASTE IN SALT CAVITIES

Walter Lindorfer, Kassel; Wilhelm Jahn-Held, Staufenberg; Lutz J. Gerschler, Diekholzen; Berthold Jandel, Hildesheim, and Friedel Wartenpfuhl, Giesen, all of Fed. Rep. of Germany, assignors to Wintershall AG, Kassel, Fed. Rep. of Germany

Filed Nov. 18, 1983, Ser. No. 553,143

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1982, 3243594

Int. Cl.[4] B65G *15/00*

U.S. Cl. 405—53 13 Claims

1. A process for storing liquid waste in a salt cavity said process comprising the steps of treating the liquid waste above ground to produce a pumpable mixture with a pH of 7 or more, which has a

boiling point above 85° C.,

flash point above 65° C.,

vapor pressure at 60° C. of up to 0.5 kp/cm^2 and

viscosity of less than 300 cP

and which forms no toxic or flammable gases; conveying said mixture to the salt cavity; allowing the mixture to stand until separation of the mixture into a heavier and a lighter liquid phase occurs; separately pumping both phases out of the cavity, and feeding in a further corresponding volume of the pumpable mixture into the cavity.

4,578,000

METHOD OF PROTECTION

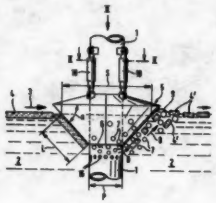
Gustav Lindqvist, Espoo, and Kimmo Juurmaa, Vantaa, both of Finland, assignors to Oy Wärtsilä Ab, Helsinki, Finland

Filed Jun. 10, 1983, Ser. No. 503,337

Claims priority, application Finland, Jun. 15, 1982, 822157

Int. Cl.[4] B63B *35/08;* E02B *17/00*

U.S. Cl. 405—211 17 Claims



1. A method for protecting a stationary construction located in water and surrounded thereby, against strain caused by a moving ice field in said water, said method comprising:

providing a protective structure having a cross-section considerably greater than the cross-section of said stationary construction and being formed to have a sloping outer surface;

arranging the protective structure around said stationary construction so that said sloping surface slopes downwards towards said stationary construction and is located at the water surface level and extends below the water surface level, to form an ice breaking surface which bends downwards ice moving against said protective structure; and

maintaining the protective structure normally in a rigid and fixed relationship with respect to the stationary construction, so as to take up upwardly directed reaction forces provided by the ice.

4,578,001

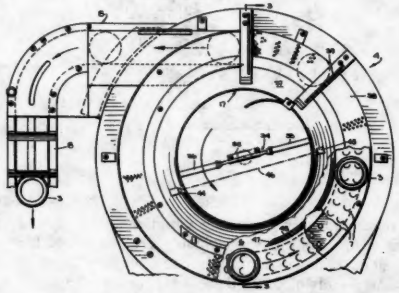
AIR CONVEYING HOPPER

Charles S. Ochs, Lancaster, and Harold L. Siler, Rockbridge, both of Ohio, assignors to Anchor Hocking Corporation, Lancaster, Ohio

Filed Dec. 29, 1980, Ser. No. 220,960

Int. Cl.[4] B65G *53/40*

U.S. Cl. 406—10 6 Claims



1. A hoppering apparatus for feeding rings with depending skirt portions comprising the combination of a hopper including a support disc for engaging a plurality of the rings, means for rotating said support disc for carrying the rings to an exit chute, and air nozzles in said disc for directing streams of air

under pressure generally circumferentially and in the direction of disc rotation and against the skirt portions of said rings for carrying the rings to said exit chute.

4,578,002

TRANSPORT APPARATUS FOR FLAT ARTICLES

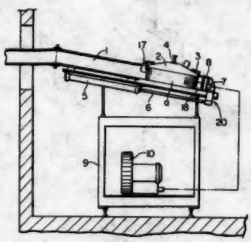
Kozo Taneda, Kodaira; Masae Chiba, Kawasaki; Junichi Naka, Tokyo, and Shunichi Watanabe, Machida, all of Japan, assignors to Snow Brand Milk Products Co., Ltd., Sapporo, Japan

Filed Jun. 12, 1984, Ser. No. 619,769

Claims priority, application Japan, Jun. 22, 1983, 58-113176

Int. Cl.⁴ B65G *53/40, 51/02*

U.S. Cl. 406—28 **6 Claims**



1. In a transport apparatus in which articles to be transported are inserted in a transport pipeline and the articles are transported under the application of air flow through the pipeline, the improvement which comprises; a transport pipeline which is inclined upwards in the direction of transport at a loading station of said transport pipeline and stands uprightly to terminate in a downwardly directed opening at an unloading station, push means provided at said loading station of said pipeline, said push means comprising a cylinder having a piston rod, movable therein, a push plate coupled to said piston rod and an air pipe mounted on said push plate, said push plate being movable in the longitudinal direction of said pipeline and adapted to push said articles into said pipeline while pressurized air is fed through said air pipe to move said articles through said pipeline and, an annular resilient band provided near said downward opening, and an air supply means for projecting said resilient band toward the center of said downward opening.

4,578,003

ARRANGEMENT FOR SUPPLYING COOLANT TO ROTATING CUTTING TOOLS FOR METAL MACHINING, IN PARTICULAR BORING TOOLS, PROVIDED WITH COOLANT DUCTS

Otto Eckle, Loechgau, Fed. Rep. of Germany, assignor to Komet Stahlhalter-und Werkzeugfabrik Robert Breuning GmbH, Besigheim, Fed. Rep. of Germany

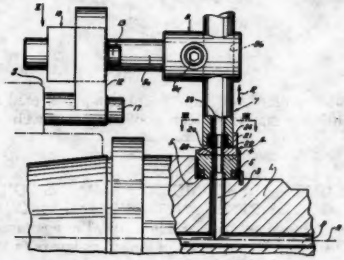
Filed Jul. 19, 1983, Ser. No. 515,318

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1982, 3232495

Int. Cl.⁴ B23B *51/06*

U.S. Cl. 408—56 **11 Claims**

1. In an apparatus for supplying a fluid coolant to a cutting tool which is supported for rotation about a tool axis, which has a coolant channel therein, and which has a coolant ring rotatably supported on a shank thereof for movement about said tool axis relative to said tool, said coolant ring having sealing means which engages said tool shank and effects a seal between said tool shank and said coolant ring and having a radially projecting coupling piece which has a coolant bore extending radially inwardly thereinto; said apparatus further including a carrier piece supported on a stationary machine part, a holder which is supported on said carrier piece for movement generally parallel to said tool axis and for rotation about an adjusting axis, means for releasably clamping said holder in a selected position with respect to said carrier piece, and a coupling head which is supported on said holder for movement generally radially of said tool axis and has a radially extending outlet bore, rotation of said cutting tool when said coupling piece and coupling head are free of engagement causing said coolant ring to rotate with said cutting tool until said coupling piece and coupling head are in a position of sealing engagement in which said coolant bore and said outlet bore are in fluid communication; the improvement comprising: two spaced intermediate pieces which each have at one end an extension which projects outwardly in a direction substantially parallel to said tool axis, a bore therethrough which extends through said extension thereon substantially parallel to said



tool axis, and a slot which extends radially with respect to said bore; two fastening bolts which each extend substantially parallel to said tool axis through the bore in a respective said intermediate piece and engage a respective threaded opening provided in said stationary machine part; and two clamping bolts which each extend parallel to said tool axis through the slot in a respective said intermediate piece and engage a respective threaded opening provided in said carrier piece; wherein said carrier piece is generally T-shaped and has a stem and a cross-part, said carrier piece having said threaded openings for said clamping bolts at opposite ends of said cross-part and having in said stem a bore which axially slidably receives a shaft of said holder which extends parallel to said tool axis.

4,578,004

APPARATUS FOR PUNCHING A HOLE IN A PAPER WEB

Wilhelm Reil, Bensheim, Fed. Rep. of Germany, assignor to Tetra Pak Developpement S.A., Switzerland

Filed May 3, 1982, Ser. No. 374,316

Claims priority, application Fed. Rep. of Germany, May 16, 1981, 3119602

Int. Cl.⁴ B23B *41/00*

U.S. Cl. 408—87 **11 Claims**

1. Apparatus for making a circular cut of predetermined depth in a paper web, said apparatus comprising:

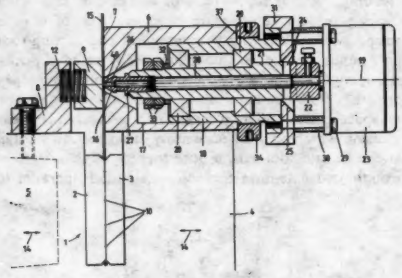
a rotatably-driven circular cutting head;

means for supporting said paper web comprising a resiliently-mounted counterplate positioned to face said cutting head perpendicular to the axis thereof, said counterplate having a surface area, facing said cutting head, which is substantially larger than the circular cutting area defined by said cuttting head;

means for moving said cutting head from a first position in which it is spaced from said paper web to a second position in which it engages said paper web and makes circular cut therein; and

means including a reciprocably movable outer carrier for adjusting the axial position of said cutting head relative to

said outer carrier and for securing said cutting head in a fixed axial position relative to said outer carrier to thereby



limit the depth of said circular cut to a preselected depth which is less than the thickness of said paper web.

4,578,005

MACHINING REFORMING APPARATUS FOR ELECTRODE OF RESISTANCE WELDING MACHINE

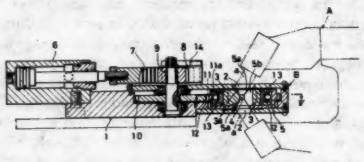
Genzo Fuse, Higashimatsuyama; Kaoru Abe, Tsurugashima, and Isao Matsumoto, Kawagoe, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 22, 1983, Ser. No. 564,533

Claims priority, application Japan, Dec. 24, 1982, 57-225923; Dec. 24, 1982, 57-225924; Jun. 16, 1983, 58-106785

Int. Cl.[4] B23C *3/12*

U.S. Cl. 409—140 **6 Claims**



1. A machining reforming apparatus for machining electrodes of a resistance welding device, said apparatus comprising;

(a) a body, said body having an insertion means for receiving at least one electrode;

(b) receiving base means positioned within said body for abutting a front end surface of an electrode inserted therein; and

(c) at least one rotary cutter means rotatable in said body about an axis substantially perpendicular to said base means, said cutter means having a cutter portion for removing from the electrode inserted therein portions on said electrode projecting only from sides of said front end surface abutting said base means.

4,578,006

IMPELLER UNDER FILE MACHINE

Stanley J. Gray, Bixby, Okla., assignor to Borg-Warner Corporation, Chicago, Ill.

Continuation of Ser. No. 39,634, May 16, 1979, abandoned. This application Oct. 21, 1983, Ser. No. 544,181

Int. Cl.[4] B23D *5/02*

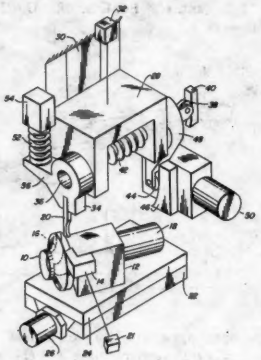
U.S. Cl. 409—303 **2 Claims**

1. Apparatus for underfiling curvilinear vanes on centrifugal pump impellers which are cast with vanes of substantially uniform thickness and which are filed to vanes which taper from a relatively thin edge to a thicker and unchanged central thickness comprising:

a non rotating cutting tool movable along a predetermined path of travel;

indexing means for supporting and rotating an impeller about its axis to sequentially position each impeller vane so that its edge is facing upwardly beneath the cutting tool;

actuating means to move said cutting tool vertically downward toward and into engagement with a vane for an initial portion of its predetermined path of travel and then in a curvilinear direction for the remainder of its movement along the predetermined path of travel so that it



shapes one surface only of the vane therebeneath to provide the taper to said vane; said actuating means comprising first operative means for imparting generally vertical movement to said cutting tool along a spatially fixed generally vertical axis, second operative means including a first cam and follower for controlling the movement of said cutting tool generally downwardly and then in a curvilinear direction, third operative means including a second cam and follower for moving said cutting tool laterally across said vane to insure that the entire vane is underfiled, and means to resiliently urge each cam into engagement with its respective follower.

4,578,007

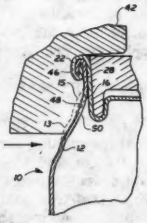
REFORMING NECKED-IN PORTIONS OF CAN BODIES

Hans H. Diekhoff, Greensburg, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 428,492, Sep. 29, 1982, abandoned. This application Mar. 12, 1984, Ser. No. 588,355

Int. Cl.[4] B21D *51/32*

U.S. Cl. 413—6 **6 Claims**



1. A method of providing an essentially right cylindrical-shaped portion of a multiple necked-in and flanged can body adjacent a double-seamed bead of a closed can, the method comprising:

rotating said can body about its longitudinal axis; and

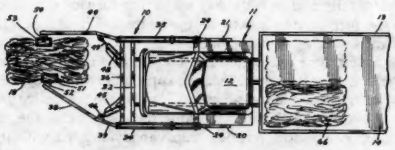
contacting said rotating can body with means for reforming at least a portion of the necked-in can body to produce an essentially right cylindrical-shaped reformed portion adjacent the double-seamed bead of the closed can.

4,578,008

HAY BALE LOADER

Harold T. Gleason, Box 119, Tolna, N. Dak. 58380

Filed Apr. 27, 1984, Ser. No. 604,875
Int. Cl.[4] A01D *87/12*; B60P *1/48*
U.S. Cl. 414—24.5 17 Claims



1. A lifting and loading apparatus for use in conjunction with a vehicle having a load-bearing bed, comprising:

stationary frame means fixed to the vehicle on first and second opposite sides of the vehicle with respect to a vehicle center line;

a lift frame assembly movably assembled to the stationary frame means, said lift frame including a first lift leg having an inner end and an outer end, means pivotally connecting the inner end of the first lift leg to the stationary frame means on a first side of the vehicle permitting rotation of the outer end about a first horizontal axis in an arc extended between a generally horizontal extended position with respect to the vehicle and an overhead past vertical position with respect to the vehicle, a second lift leg having an inner end and an outer end, means pivotally connecting the inner end of the second lift leg to the stationary frame means on the second side of the vehicle in coaxial relationship with the first lift leg permitting rotation of the outer end of the second lift leg about said first horizontal axis in an arc in parallel relationship to the first lift leg, means connecting said outer ends of the first and second lift legs, and first power means for rotating the first and second lift legs between said positions;

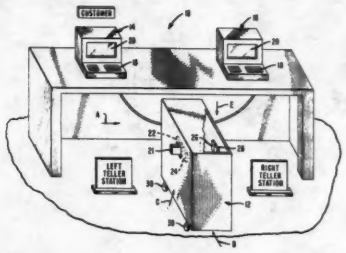
a first rigid load arm having an inner end and an outer end, means pivotally connecting the inner end of the first load arm to the lift frame assembly on the first side of the vehicle in fixed relation to the lift frame assembly with respect to rotation about said first horizontal axis and permitting pivotal movement of its outer end about an axis perpendicular to the first horizontal axis and said outer end being movable in and through an arc intersecting the vehicle center line, a second rigid load arm having an inner end and an outer end, means pivotally connecting the inner end of the second load arm to the lift frame assembly on the second side of the vehicle in fixed relation to the lift frame assembly with respect to rotation about said first horizontal axis and permitting rotation of the outer end about an axis parallel to and spaced apart from the axis of rotation of the first load arm and said outer end being movable in and through an arc intersecting the vehicle center line, said outer ends of the first and second load arms movable toward and away from one another in side-by-side relationship with respect to the vehicle upon pivotal movement about respective pivotal axes, second power means for pivotal movement of the first and second load arms toward and away from one another, a first gripping member pivotally connected proximate the outer end of the first load arm and a second gripping member pivotally connected proximate the outer end of the second load arm whereby the second power means can be actuated to bring the outer ends of the first and second load arms toward one another to grip a load for lifting of the load upon pivotal movement of the first and second lift legs from the generally horizontally extended position to the overhead position for deposit of a load on the vehicle bed.

4,578,009

COLLECTOR AND CARRIAGE MECHANISM FOR USE IN A SHEET DISPENSER

Robert H. Granzow, Miamisburg; Richard H. Daulton, Kettering; Dale L. Placke; Donald L. Adelberger, both of Dayton; Jack R. Gross, Waynesville, and Charles S. Nagy, Dayton, all of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Mar. 28, 1984, Ser. No. 594,451
Int. Cl.[4] B65H *39/42*
U.S. Cl. 414—43 11 Claims



9. A sheet dispenser comprising:

a housing having first and second sheet dispensing area therein;

means for storing sheets within said housing;

means for collecting sheets at a home position within said housing;

means for delivering sheets to be dispensed from said storing means to said collecting means;

a member having one end pivotally mounted on said collecting means and a resilient means for biasing said member from a first position past a dead center position to a second position in which a free end of said member resiliently compresses said sheets on said collecting means;

actuating means located at said home position for selectively moving said member beyond said dead center position to enable said resilient means to bias said free end to said second position and also for returning said member to said first position;

a support structure;

first means for mounting said support structure for pivotal movement between associated first and second positions in said housing;

second means for mounting said collecting means on said support structure for movement from said home position to said first and second sheet dispensing areas;

first moving means located on said support structure for selectively moving said collecting means from said home position to said first and second sheet dispensing areas and also for returning said collecting means to said home position;

a purge bin located beneath said collecting means when said collecting means is in said home position;

second moving means for selectively moving said support structure from said associated first position to said associated second position to enable sheets left on said collecting means to fall into said purge bin; and

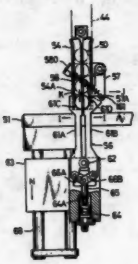
control means operatively coupled to said delivering means, actuating means and first and second moving means to control the movement of sheets from said storing means to said first and second sheet dispensing areas and said purge bin.

4,578,010

ELECTRONIC COMPONENT SELECTION AND SUPPLY APPARATUS IN AUTOMATIC ELECTRONIC COMPONENT INSERTING MACHINE

Kotaro Harigane; Keiichi Ihara; Tetsuro Ito, and Hirokazu Shudo, all of Tokyo, Japan, assignors to TDK Corporation, Japan

Filed Oct. 28, 1982, Ser. No. 437,329
Claims priority, application Japan, Oct. 31, 1981, 56-173702; Nov. 16, 1981, 56-169518[U]; Nov. 20, 1981, 56-172155[U]
Int. Cl.⁴ H05K 3/30
U.S. Cl. 414—126 15 Claims



1. In a machine for processing and inserting electronic components into lead receiving openings in a printed circuit board,

a selection and supply apparatus for selecting and moving an electronic component to a first position and supplying said selected electronic component to a second predetermined position, comprising:

electronic component sequence means for selecting a predetermined electronic component, said sequence means including a shaft mounted for intermittent rotation, a plurality of substantially vertical electronic component magazines coupled to said shaft at locations therearound, adjacent pairs of magazines being mutually spaced from each other by equal angular distances, each of said magazines adapted to accommodate a plurality of substantially vertically stacked electronic components therein, and intermittently activated drive means for rotating said shaft through angles equal to an integral multiple of said angular distance between adjacent magazines in response to an instruction to supply a predetermined kind of electronic component to the first position located below or at the bottom of a corresponding one of said electronic component magazines to thereby situate a lowermost one of the electronic components in any of said magazines which constitutes the predetermined kind of component in the first position; and

chuck means for receiving the predetermined electronic component which was selected by said electronic component sequence means and moved to said first position and for supplying said electronic component to said second predetermined position, said chuck means including a first chuck for gripping a body of the selected electronic component to extract the same from said first position and move the same to an intermediate position, and a second chuck for gripping a lead of the electronic component at said intermediate position and moving the component to said second predetermined position, said first chuck being movable in a longitudinal direction of the corresponding one of said electronic component magazines.

4,578,011

DEVICE FOR CHARGING STEEL PRODUCTS IN A REHEATING OR TREATMENT FURNACE

Yves Braud, Maurepas, and Jean Fromentin, Paris, both of France, assignors to Stein Heurtey Ste Anonyme, Ros Orangis, France

Filed May 17, 1984, Ser. No. 611,402
Claims priority, application France, May 18, 1983, 83 08656
Int. Cl.⁴ F27B 9/14
U.S. Cl. 414—152 3 Claims

1. In combination with:

a treatment furnace having a longitudinally and horizontally extending charging opening;

a horizontally and transversely extending furnace conveyor in the furnace and having an upstream end in the vicinity of the charging opening; and

a loading conveyor including a longitudinally extending array of transversely extending approach rollers adjacent the charging opening, whereby a workpiece to be treated in the furnace can be rolled longitudinally along the approach rollers to a position transversely aligned with the charging opening,

a loading apparatus including:

at least two transversely extending arms each having an inner end pivoted inside the furnace about a longitudinal axis at the upstream end of the furnace conveyor and an outer end outside the furnace, the arms extending through the charging opening and between the approach rollers;

an array of longitudinally extending loading rollers rotatable about horizontal and longitudinal axes on the arms;

means for raising the outer ends of the arms and thereby pivoting the arms and the loading rollers carried thereby from a lower position with the loading rollers below the approach rollers to an upper position with the loading rollers above the approach rollers, whereby a longitudinally extending workpiece in transverse alignment with the charging opening is supported for longitudinal movement on the approach rollers in the lower position of the arms and is supported for transverse movement on the loading rollers in the upper position of the arms; and

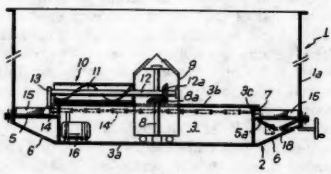
means for transversely pushing a workpiece supported on the loading rollers outside the furnace through the charging opening into the furnace and onto the upstream end of the furnace conveyor.

4,578,012

DEVICE FOR DISCHARGING PULVERULENT PRODUCTS CONTAINED IN A SILO

Raymond Petit, Tours, France, assignor to Guery S.A., Chemille, France

Filed Feb. 2, 1984, Ser. No. 576,138
Int. Cl.⁴ B65G 65/46
U.S. Cl. 414—310 3 Claims



1. A device for discharging pulverulent products contained in a cylindrical silo, the discharge of said products taking place in an appropriate part of the lower periphery of the silo, said device comprising a radial horizontal arm equipped with an Archimedean screw, said arm being placed in the immediate vicinity of the lowest part of the silo and being mounted on a turret while a fixed vertical shaft is placed inside the turret co-axially with the silo and is provided with a first pinion

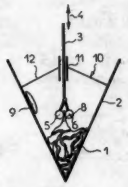
which cooperates with a second pinion wedged on the shaft of the Archimedean screw, whereas means are provided to drive the arm and turret in rotation about the axis of the silo, wherein a cylindrical bin of diameter smaller than that of the silo and having an upper tray which constitutes both the support for the device and the lowest part of the silo, which bin comprises a flange which extends radially as far as the cylindrical wall of the silo and defines a peripheral groove with said upper tray and wherein said drive means are constituted by an endless chain housed in said groove and coupled to the outer end of the horizontal arm, said groove further presenting an opening in which is placed a sprocket-wheel which cooperates with the chain and is driven by a motor situated inside the bin.

4,578,013

DEVICE FOR PICKING UP LOOSE ARTICLES

Christian Barillec, Tourcoing; Dominique Janvier, Lille, and Marc Bonneton, Tourcoing, all of France, assignors to Societe Anonyme Redoute Catalogue, Roubaix, France

Filed Feb. 10, 1984, Ser. No. 578,865
Claims priority, application France, Nov. 29, 1983, 83 19256
Int. Cl.[4] B65G *3/04*
U.S. Cl. 414—323 **9 Claims**



1. A device for picking up loose articles one at a time said articles being inherently soft such as textiles or being packaged in a supple envelope such as a plasticized film bag, said articles being disposed in bulk in a flared container having an open top to provide access to said articles, said device comprising:

a manipulatable mobile arm adapted to descend vertically through the opening of said container in order to lift one of the articles from the container,

a pair of cylindrical wheels of small diameter rotatably mounted at a lower end of said arm, each of said wheels having a periphery and a concentric axis of rotation substantially perpendicular to the direction of vertical displacment of said arm, said wheels being mounted resiliently with their peripheries pressed against one another and being separable by entry of an article between them,

means for driving said wheels continuously for rotation in opposite directions so as to nip an article or its envelope between them, and

control means for detecting the presence of an article taken between the wheels and controlling said driving means to stop the rotation of said wheels.

4,578,014

AUTOMOBILE TRAY TRAILER

Ralph Colet, 6018 Paxton Ct., San Jose, Calif. 95123

Filed Nov. 17, 1983, Ser. No. 552,607
Int. Cl.[4] B60P *3/12*
U.S. Cl. 414—483 **14 Claims**

1. A transportable tray trailer apparatus for towing behind a tractor vehicle and adapted for transporting motor vehicles thereon comprising:

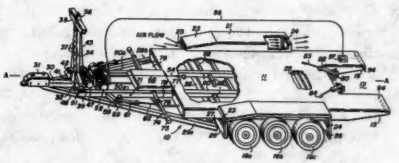
a tiltable tray portion including a first flat rectangular bed attached to a primeter framework, a securing means for securing and centering a vehicle about a vehicle loading portion of said bed, the tray further including a first and a second longitudinal member positioned parallel to each other and to an axis of motion of the trailer and rigidly attached to a front portion of said perimeter framework;

a wheel means attached to opposite lateral sides of said perimeter framework for movably supporting the tray portion at an elevated position above the ground;

a towbar means for attaching the tray to a tractor vehicle, the towbar means including a first and a second V-member pivotably attached to each front lateral side of said perimter framework and rigidly attached to a longitudinal neck member, said neck member having at an anterior terminal end a hitch formed for attachment to said tractor vehicle;

a winch means secured to said longitudinal members for loading a motor vehicle onto the tray;

a tilting means formed to the towbar means and to the tray and including a vertical column pivotably mounted to said neck member, said column including a plurality of spaced-



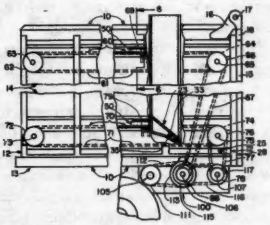
apart apertures, a horizontal cross member secured to said first and second longitudinal members and slidably fitting over said column and including a lift means for lifting said first and second longitudinal members relative to said column and a locking means to secure said longitudinal members in a lifted position about said apertures; and said wheel means are partially enclosed by a fender means, said fender means including a front angled portion, an intermediate horizontal portion, and a rear vertical portion, said front and rear portions each including apertures, with said front aperture being smaller than said rear aperture resulting in a slight downward force on the trailer during transport, said slight downward force improving stability of said trailer during transport, said fender means further including a front air dam extend laterally underneath the tray and immediately in front of the wheel means, and a rear air dam extending laterally underneath the tray and behind the wheel means.

4,578,015

TRUCK BODY WITH PULL-OFF DOOR

Wallace E. Baldarelli, West Boylston, and Wilfred J. Grenier, Rutland, both of Mass., assignors to Baldarelli Bros., Inc., West Boylston, Mass.

Filed Jun. 16, 1983, Ser. No. 505,055
Int. Cl.[4] B60P *1/00*
U.S. Cl. 414—513 **1 Claim**



1. In an elongated load carrying body arranged to be mounted fixedly on a track or truck trailer including an elongated bottom panel and elongated opposite side panels, all three with smoothly contoured inner surface, a rearwardly

located load constraining door selectively closed and latched to contain a load within the elongated body or unlatched and open to release a load from the elongated body, an initially forwardly located load moving door having bottom and side edge sealing portions maintained in sealed sliding engagement with the inner surfaces of the bottom panel and the opposite side panels, respectively, the load moving door being supported upon opposed door supporting arms respectively passing through cooperating elongated slots extending lengthwise of and through the opposite side panels for engagement with and synchronous movement by load moving door driving means respectively mounted upon the opposite side panels outwardly beyond each of said slots and operative to move the load moving door lengthwise of the elongated body toward and away from the load constraining door to form a load carrying compartment of a length variable with movement of the load moving door, the improvement comprising:

relatively shallow and relatively wide elongated channels disposed lengthwise of and recessed in and outwardly from the otherwise smoothly contoured inner surfaces of the opposite side panels and each having a back wall including upper and lower portions thereof together straddling one of the relatively narrower lengthwise elongated slots,

elongated flexible sealing strips disposed entirely within and closely interfitted within and filling each said elongated channel, the exposed inner surface of each said flexible sealing strip being smoothly contoured and coacting with the otherwise smoothly contoured inner surface of the adjoining and coacting side panel to form an uninterrupted smoothly contoured and fully sealed inner surface throughout the load carrying compartment of the elongated body in uninterrupted sealed engagement with the edge sealing portions of the load moving door, wherein the upper and lower portions of the back wall of each said relatively wide elongated channel, respectively adjacent the upper and lower edges of each relatively narrow elongated slot and each fixedly supported by the coacting elongated side panel, respectively fixedly support the upper and lower edges of its associated elongated flexible sealing strip, and thereby support the entire elongated flexible sealing strip, against any substantial outward deflection thereof by the accumulated weight of material confined within the load carrying compartment of the elongated body, thereby maintaining each said relatively narrow elongated slot fully sealed lengthwise of the entire load carrying compartment,

fastening means securing the upper edge of each said flexible sealing strip to the upper portion of the back wall of each said channel, to maintain each said flexible sealing strip in operative relation to its coacting side panel and to allow inward deflection of the lower edge of each said flexible sealing strip outside of the load carrying compartment of the elongated body to permit the passage therebehind of one of the supporting arms for the load moving door, and

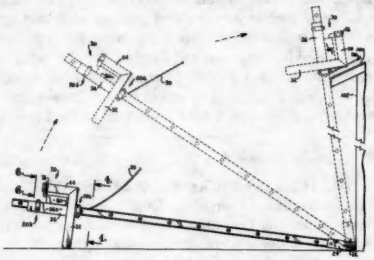
a plurality of elongated constraining means for the load moving door, each mounted fixedly upon the elongated load carrying body adjacent to and outwardly beyond each fully sealed elongated slot, and each including an opposed pair of elongated straight rigid track members together supporting and closely confining a slide assembly fixedly attached to the outer end of each door supporting arm for movement of the respective slide assemblies freely lengthwise of the elongated load carrying body only, responsive to the operation of the door driving means, and not otherwise either vertically or horizontally.

4,578,016

SHINGLE LOADING LADDER

John H. Richardson, 804 Duck Rd., Grandview, Mo. 64030

Filed Jun. 20, 1983, Ser. No. 506,201
Int. Cl.[4] E06C *1/00, 7/16*
U.S. Cl. 414—680 **35 Claims**



1. For use with a conventional ladder having first and second parallel side rails with a plurality of parallel rungs laterally extending therebetween, structure for raising ground-adjacent material, such as shingles, to the roof of a structure comprising:

an imaginary axis of rotation extending between the bottom ends of said side rails;

cradle means attached to said ladder adjacent the upper end thereof for releasably engaging said material therein, said cradle comprising:

first and second support arms;

means for mounting said respective support arms to a respective side rail in a direction extending away from said side rails; and

a leg member extending from each support arm and towards the upper end of said ladder, each leg member terminating in an end spatially adjacent said respective side rail to allow for insertion of said material therebetween, said support arms offering basal support and cooperating with said leg members to maintain said material in place during ladder rotation; and

means for rotating said ladder about said axis between ground-adjacent and upstanding positions to concurrently raise the cradle and present the same to a user on said roof for release of said material from said cradle.

4,578,017

METHOD FOR STOPPING A MULTI-STAGE HYDRAULIC MACHINE

Taizo Nakamura, and Katsuyuki Kawahara, both of Hachioji, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 13, 1984, Ser. No. 599,773
Claims priority, application Japan, Apr. 14, 1983, 58-66020
Int. Cl.[4] F01D *21/14;* F03B *13/10*
U.S. Cl. 415—1 **6 Claims**

1. A method for stopping a multi-stage hydraulic machine having an inlet valve, guide vanes including highest stage movable guide vanes and lowest stage movable guide vanes, and a return passage connected between flow passages of respective stages, said multistage hydraulic machine being in turbine operation, said method comprising the steps of:

initiating the closing of said highest stage movable guide vanes;

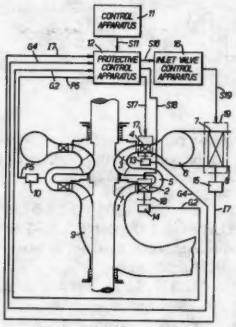
initiating the closing of said lowest stage movable guide vanes after initiation of closing said highest stage movable guide vanes;

judging whether a closing relation between said highest stage movable guide vanes and said lowest stage movable guide vanes is normal or not in accordance with predetermined criteria after initiation of closing said lowest stage movable guide vanes, said judging step including the steps of,

continuing to close said lowest stage movable guide vanes when said closing relation is judged to be normal and said lowest stage movable guide vanes are in closing operation,

stopping the closing of said lowest stage movable guide vanes when said closing relation is judged to be abnormal and said lowest stage movable guide vanes are in closing operation, and

continuing to stop the closing of said lowest stage movable guide vanes when said closing relation is judged to be



abnormal and closing of said lowest stage movable guide vanes is stopped;

resuming closing of said lowest stage movable guide vanes when said closing relation is judged to be normal and closing of said lowest stage movable guide vanes is stopped;

repeating said judging step if said lowest stage movable guide vanes are not completely closed; and

closing said inlet valve after said highest stage movable guide vanes are completely closed.

4,578,018

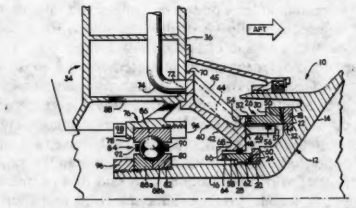
ROTOR THRUST BALANCING

Adam N. Pope, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Continuation of Ser. No. 506,141, Jun. 20, 1983, abandoned. This application Jul. 8, 1985, Ser. No. 752,498

Int. Cl.[4] F01D *3/04*

U.S. Cl. 415—14 **5 Claims**



5. In a gas turbine engine, including a rotor supported axially by at least one rotor thrust bearing, means for reducing the axial thrust on said bearing, comprising:

(a) an annular, sealed pressure chamber coaxial with the center axis of said rotor wherein said chamber is bounded by a portion of said rotor, a non-rotating member, and sealing means operatively connecting said rotor and non-rotating member, said sealing means positioned as to define a radially outer and inner seal for said sealed pressure chamber; and

(b) means for supplying hydraulic fluid to said chamber at a pressure proportional to said axial thrust on said thrust bearing.

4,578,019

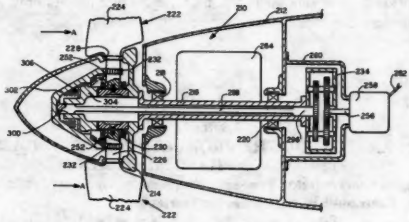
RAM AIR TURBINE

William F. Safarik, Manhatten Beach, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed May 28, 1982, Ser. No. 383,084

Int. Cl.[4] F01D *7/02;* **F03D** *7/04*

U.S. Cl. 416—1 **23 Claims**



1. The method of pivotally adjusting the relative pitch of a fluid energy reactive blade member carried upon a rotor member comprising the steps of providing a reference speed shaft, coupling said reference speed shaft to said blade member via linkage means rotatable with said rotor member, pivoting said blade member via said linkage means in response to a rotational speed difference between said reference speed shaft and said rotor member, and providing a centrifugally responsive apparatus in association with said linkage means for pivotally adjusting the pitch of said blade member in response to rotation of said rotor member.

4,578,020

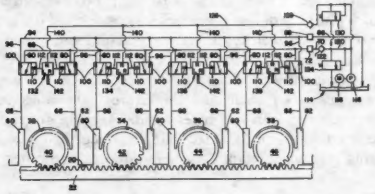
HYDRAULIC MOTOR

Josef Bartos, 8955 N. Shiloh Dr., Chesterland, Ohio 44026

Continuation of Ser. No. 574,977, Jan. 30, 1984, abandoned. This application Oct. 1, 1985, Ser. No. 782,189

Int. Cl.[4] F01C *1/08*

U.S. Cl. 418—196 **5 Claims**



1. A variable hydraulic motor comprising, housing means providing a primary chamber having a first axis and a plurality of secondary chambers opening into said primary chamber, a primary gear in said primary chamber rotatable about said first axis, a secondary gear in each of said secondary chambers rotatable about a corresponding second axis parallel to said first axis, each of said secondary gears being in meshing engagement with said primary gear along a line through said first axis and the corresponding one of said second axes, each of said secondary chambers having a pair of fluid flow ports, the ports of each pair opening into the corresponding secondary chamber on circumferentially opposite sides of the corresponding one of said lines, means providing hydraulic fluid inlet and outlet lines, said pair of ports of each said secondary chamber being connected across said inlet and outlet lines, and means for selectively controlling fluid flow to each port of said pair of

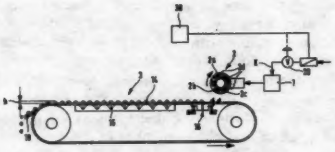
ports of each said secondary chamber including valve means for each port of said pair of ports, each said valve means having a first position blocking fluid flow through said inlet line to the corresponding one of said pair of ports and permitting fluid flow through said outlet line from said one port, and a second position permitting fluid flow through said inlet line to said one port and blocking fluid flow through said outlet line from said one port; and valve control means operatively associated with the valve means of each said pair of ports for normally maintaining each said valve means in said first position and for selectively moving one of said valve means from said first position to said second position thereof while maintaining the other valve means in said first position thereof.

4,578,021

APPARATUS FOR THE PRODUCTION OF GRANULES FROM TWO-PHASE MIXTURES

Konrad Schermutzki, Remseck, Fed. Rep. of Germany, assignor to Santrade Ltd., Lucerne, Switzerland

Filed Nov. 1, 1983, Ser. No. 547,492
Int. Cl.[4] B29C *39/38, 39/44*
U.S. Cl. 425—6 **12 Claims**



1. An apparatus for producing granules from two-phase mixtures comprising a temperature controlled precrystallizer means for cooling an initial substance enriched with crystal nuclei and wherein the resultant precrystallized melt is fully crystallized on a cooling surface, said apparatus further comprising a droplet former disposed over said cooling surface and including inner and outer telescoping tubes, said tubes having mutually facing surfaces which interengage, said inner tube communicating downstream with said precrystallizer and having a plurality of outlet orifices for conducting the precrystallized melt outwardly therethrough, said outer and inner tubes being arranged for relative rotation, said outer tube having a plurality of discharge orifices which are intermittently alignable with said outlet apertures in response to relative rotation between said tubes for discharging drops of precrystallized mass onto said cooling surface, and means for effecting relative rotation between said inner and outer tubes.

4,578,022

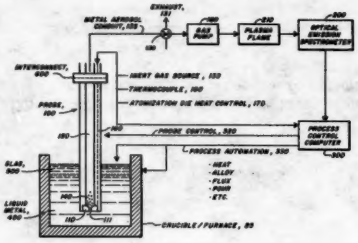
APPARATUS FOR IN-PROCESS MULTI-ELEMENT ANALYSIS OF MOLTEN METAL AND OTHER LIQUID MATERIALS

George B. Kenney, 131 Green St., Medfield, Mass. 02052

Filed Aug. 12, 1983, Ser. No. 522,913
Int. Cl.[4] B22F *9/00*
U.S. Cl. 425—7 **21 Claims**

1. A probe apparatus, for generating from a melt an aerosol powder for being subject to in-process analysis, the apparatus comprising:

an atomization die having an orifice through which the melt is aspirated along a flow axis to create an aerosol, such orifice (i) being in the size range at and above that size which is just sufficient to permit generation of such powder by flow of the melt therethrough and (ii) having in at



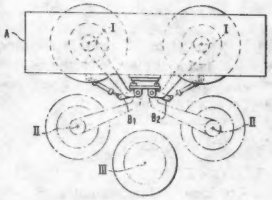
least one direction perpendicular to the flow axis a dimension less than approximately five millimeters.

4,578,023

APPARATUS FOR LOADING GREEN TIRES

Nobuhiko Irie, Nagasaki, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 512,129, Jul. 8, 1983. This application Jul. 23, 1985, Ser. No. 757,867
Claims priority, application Japan, Jul. 23, 1982, 57-128363; Jul. 28, 1982, 57-131860
Int. Cl.[4] B29H *5/02*
U.S. Cl. 425—38 **15 Claims**



1. A curing press apparatus, comprising:

a curing press having first and second laterally aligned chambers for curing respective green tires therein, and having a center portion therebetween, each chamber being defined by an upper mold having an upper bead ring and a lower mold, at least one of said upper and said lower molds being reciprocally vertically movable with respect to the other to open and close said chambers;

a green tire loading mechanism mounted to said press in front of said center portion of said press, said loading mechanism including first and second movable green tire loading devices having upwardly directed gripping claws, for respectively loading a first green tire having first and second opposite bead portions from a first standby position in front of said first chamber into said first chamber, and loading a second green tire having third and fourth opposite bead portions from a second standby position in front of said second chamber into said second chamber;

a green tire placing table which is angularly movable 180° C. about a horizontal axis, located at a center position in front of said center portion of said tire curing press, and having means for supporting the first and second green tires with their respective first and third bead portions down; and

means for transferring the first green tire from said center position on said table with the first bead portion down to said first standby position on the gripping claws of said first loading device with the second bead portion down, and for transferring the second green tire from said center

position on said table with the third bead portion down to said second standby position on the gripping claws of said second loading device with the fourth bead portion down, said transferring means including

means for moving the first green tire from said center position to said first standby position on one of said table and the gripping claws of said first loading device,

means for moving the first green tire from said table onto the gripping claws of said first loading device with the second bead portion down,

means for inverting said table with the first green tire thereon,

means for moving the second green tire from said center position to said second standby position on one of said table and the gripping claws of said second loading device,

means for moving the second green tire from said tire onto the gripping claws of said second loading device with the fourth bead portion down and

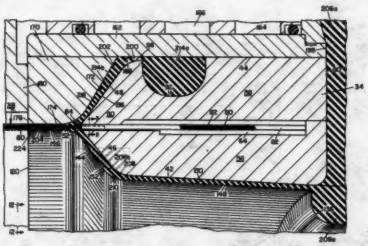
means for inverting said table with the second green tire thereon.

4,578,024

COEXTRUSION APPARATUS

Richard W. Sicka, Brecksville, and Dale A. Tompkins, Akron, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Feb. 22, 1985, Ser. No. 704,243
Int. Cl.[4] B29F *3/04, 3/10*
U.S. Cl. 425—114 **32 Claims**



1. A coextrusion head for producing a generally tubular elastomeric ply made up of first and second coaxial tubular streams of elastomeric materials having interposed adjacent to their interface a closely and uniformly spaced large array of parallel and independent reinforcing elements, said coextrusion head comprising in combination:

(a) a reinforcing element guide subassembly including a generally annular guide element having an outer wall surface and an inner wall surface as well as axially-directed guide means for individually and independently directing and accurately positioning a circular array of closely and uniformly spaced individual reinforcing elements;

(b) a generally annular inner die assembly, having inner and outer wall surfaces, coaxial with and located substantially radially inwardly of said annular guide element, at least one of said annular guide element and said inner die assembly having a 360° annular contoured channel in the wall surface, opposed to the wall surface of the other, said channel together with said opposed wall surface forming a first distribution channel;

(c) a generally annular outer die assembly, having inner and outer wall surfaces, coaxial with and located substantially radially outwardly of said annular guide element;

(d) at least one of said annular guide and said outer die assembly having a 360° annular channel in the wall surface opposed to the wall surface of the other, said channel together with said opposed wall surface forming a second distribution channel;

(e) the axial outer portions of the inner and outer wall surfaces of said annular guide element having converging portions merging into an end portion having a narrow annular outer end surface with said guide means having axial outlet end faces co-planar with said guide element narrow annular end surface;

(f) a portion of the outer wall surface of said inner die assembly and a portion of the inner wall surface of said annular guide element, both axially outward of said first distribution channel, cooperating to form a first generally tubular extrudate path;

(g) a portion of the outer wall surface of said annular guide element and a portion of the inner wall surface of said outer die assembly,, both axially outward of said second distribution channel, cooperating to form a second generally tubular extrudate path;

(h) the axially outermost portions of the inner wall surface of said outer die and the outer wall surface of said inner die cooperating to form a third generally tubular extrudate path, said first and second extrudate paths merging together into said third generally tubular extrudate path at the narrow annular end surface of said guide element;

(i) first and second inlet streams of elastomeric materials enter said first and second distribution channels and consequently said first and second annular tubular extrudate paths, respectively, and produce said first and second tubular streams which merge together into a combined third tubular stream of elastomeric material in said third extrudate path;

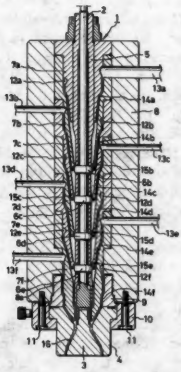
(j) said individual reinforcing elements being introduced into the interface between said first and second streams of tubular elastomeric material as they merge together simultaneously with said individually and independently guided reinforcing elements into said third tubular stream of elastomeric material thus producing said tubular elastomeric ply that is internally provided with said closely and uniformly spaced array of parallel reinforcing elements.

4,578,025

DIE ASSEMBLY FOR EXTRUDING MULTILAYER PARISONS

Kazuo Ando, 18-14, Hirata 2-chome, Ichikawa-shi, Chiba-ken, and Yoshiaki Matsuo, 33-13, Hanada 1-chome, Koshigaya-shi, Saitama-ken, both of Japan

Filed Nov. 21, 1984, Ser. No. 673,589
Int. Cl.[4] B29C *47/06*
U.S. Cl. 425—133.1 **1 Claim**



1. A die assembly for extruding multilayer parisons which comprises a parison programming shaft, having a lowermost end; a core pin which is attached to said lowermost end of said parison programming shaft; a mandrel which encircles said parison programming shaft; a plurality of control rings which

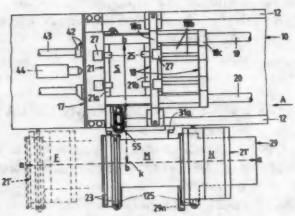
are mounted on said mandrel at predetermined intervals; a plurality of sleeves which are installed around said mandrel, and each said sleeve has an outside wall that is provided with an inclined groove and has a lower part which is of an inverted frustoconical shape; each said sleeve having an inner wall, with a lower end, an annular rib formed on said lower end of said inner wall of each said sleeve, a housing which holds therein the above members; the housing having a bottom part; a controlling member to control the resin quantity of the outer layer of parisons, said controlling member is movably attached to said bottom part of said housing and around the lowermost of said sleeves; said housing bottom part having a bottom face; a die supporting member which is attached to said bottom face of said housing; and a die which is supported by said die supporting member and which encircles said core pin a resin passage in said die assembly is defined and regulated by each of said control rings together with said annular rib that is formed on said lower end of the respective said inner wall of said sleeve at said ring, by said controlling member acting together with said lowermost sleeve, and by said die acting together with said core pin.

4,578,026

SAFETY COVER ARRANGEMENT FOR INJECTION MOLDING MACHINE WITH DIE EXCHANGE MECHANISM

Karl Hehl, Arthur-Hehl-Strasse 32, 7298 Lossburg 1, Fed. Rep. of Germany

Filed Jan. 9, 1984, Ser. No. 569,158
Int. Cl.[4] B29C *45/17, 45/84*
U.S. Cl. 425—151 **17 Claims**



1. A safety cover assembly for die closing unit of an injection molding machine equipped with a die exchange mechanism for the program-controlled insertion into and removal from the die closing unit of a succession of injection molding die assemblies or die halves, wherein the die exchange mechanism includes an elongated horizontal translation table with two longitudinally spaced die emplacements thereon and a translation drive moving the table longitudinally between two positions in which alternatingly one or the other of the two die emplacements occupies a central transfer position located laterally outside the clamping space of the die closing unit, while the other die emplacement occupies one of two waiting positions, and said mechanism further includes transfer guides and a transfer drive adapted to move said die assembly or die half transversely between the transfer position and the clamping space, and wherein the die closing unit and the translation table are supported on a machine base, the safety cover assembly comprising in combination:

a stationary central cover portion having a vertical stationary cover panel covering said central transfer position against lateral access thereto, while defining access an opening on opposite axial sides thereof, in approximate transverse alignment with said two waiting positions, for access to a die emplacement in waiting position; and

two sliding covers arranged to cover the two access openings, when the covers are in their closed position and movable longitudinally away from said openings, along cover guides extending parallel to the translation table; and wherein

each sliding cover is openable by moving said sliding cover in the direction of the central stationary cover portion so that, in the position of said sliding cover, is substantially superposed with the stationary cover portion; said sliding cover and

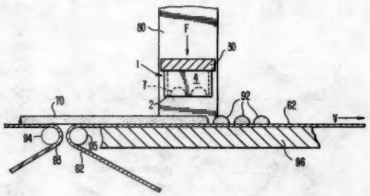
the two sliding covers move to substantally the same open position so that, when a first one of the two sliding covers is held in this position, said first sliding cover prevents the second sliding cover from being opened.

4,578,027

DIE HAVING AIR PASSAGES

Daniel A. Koppa, Bloomfield, and Walter Schaeder, Bergenfield, both of N.J., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed May 29, 1984, Ser. No. 614,859
Int. Cl.[4] A21C *5/00, 11/10*
U.S. Cl. 425—298 **14 Claims**



1. An apparatus for producing separated pieces from an extrudate rope, comprising:

a die having a lower surface;

said lower surface having at least one indentation formed therein;

a means for driving said die in a cyclic operation having an upstroke and a downstroke, in which said die travels during a portion of its operation with a downward velocity as well as a forward velocity;

a means for conveying an extrudate rope under said generally flat surface of said die;

and at least one passage through a portion of said die;

a supply of fluid communicating with said passage;

said die having a vertical leading surface and a vertical trailing surface;

a leading indentation intersection a portion of said leading surface and said bottom surface;

a trailing indentation intersecting said trailing vertical surface and said bottom surface;

whereby said die moves downward against the extrudate rope to separate the extrudate rope into pieces, the lower surface of said die and said means for conveying forcing dough therebetween toward said at least one indentation, thereby forming the extrudate rope into pieces during cyclic operation of said die; and

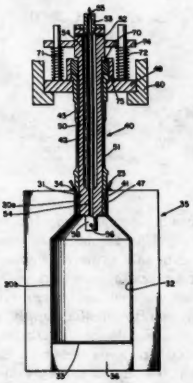
whereby during a stamping operating said trailing indentation forms a leading edge of a piece of extrudate rope, while simultaneously said leading indentation conforms to a trailing edge of a trailing piece previously formed from extrudate rope.

4,578,028

EXPANDABLE CORE PIN FOR BLOW-MOLDING A CONTAINER HAVING A NECK-PORTION WITH INTERNAL ATTACHMENT MEANS

William P. Dirksing; Marvin G. Leman, and Robert H. Van Coney, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 6, 1984, Ser. No. 678,623
Int. Cl.[4] B29C 17/07, 17/02
U.S. Cl. 425—525 8 Claims



1. A radially expandable core pin for blow-molding a thermoplastic container having a body-portion and a neck-portion, said neck-portion including a dispensing orifice and internal attachment means, said core pin being radially expandable to compression mold said internal attachment means and comprising:

(a) a plurality of circumferentially disposed core sections surrounding the central axis of said core pin, said core sections being radially moveable between a normally collapsed position and an expanded position and having outer surfaces which mate along their longitudinal adjacent sides to form a substantially continuous neck-forming surface thereabout when radially displaced to expanded position, said neck-forming surface being relieved in a predetermined pattern to form said internal attachment means of said thermoplastic container;

(b) expansion means for moving the core sections to said expanded position, said expansion means comprising a tapered expansion pin; and

(c) blowing means formed through said core pin and adapted to be connected to a pressure source for providing blow-molding pressure for forming the body portion of said thermoplastic container, said blowing means comprises an axial blow-channel formed through said tapered expansion pin and includes at least one radially disposed exit port.

4,578,029

METHOD FOR DRIVING A ROTARY KILN FOR ROASTING CEMENT RAW MEALS

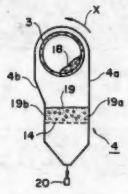
Tetsuo Fujisawa, Kobe, Japan, assignor to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Apr. 11, 1984, Ser. No. 598,965
Claims priority, application Japan, Oct. 17, 1983, 58-194516
Int. Cl.[4] F27B 15/00, 7/02
U.S. Cl. 432—14 3 Claims

1. A method for driving a rotary kiln for roasting cement raw meals and producing clinker of a more uniform size, said kiln being provided with a clinker inlet communicating a suspension preheater having a calcining furnace and a raw meal outlet spaced from said inlet along the axis of rotation of said kiln, comprising the steps of:

orienting said kiln body with a downward slope towards said outlet, said slope being in a range from 1.5% to 3.5%; and

shortening a granulating zone of said kiln by driving said kiln body with a number of rotations in a range represented by the following equation:



$$N=(0.2\text{–}0.4)\times 42.3/\sqrt{D}$$

wherein N is the number of rotations of the kiln body in revolutions per minute and D is the inside diameter in meters of refractory materials in a granulating zone of the kiln, wherein said slope is selected as a function of a desired residence time of said raw meals in said kiln and of said number of rotations,

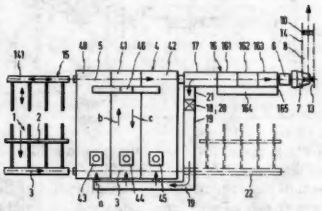
wherein said kiln having said shortened granulating zone produces clinker of more uniform size.

4,578,030

METHOD OF AND A PLANT FOR PREHEATING AND, POSSIBLY, HEAT-TREATING AND SUBSEQUENTLY DIVIDING ROD-SHAPED MATERIAL INTO SLUGS

Friedrich W. Elhaüs, Dorfstrasse 21, 7761 Moos, Fed. Rep. of Germany

Filed Jun. 25, 1984, Ser. No. 623,966
Claims priority, application Fed. Rep. of Germany, Jun. 24, 1983, 3322874
Int. Cl.[4] F27B 9/12, 9/02
U.S. Cl. 432—18 12 Claims



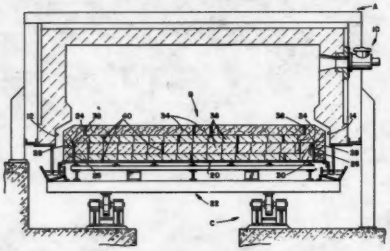
1. In a method of preheating and, possibly, heat-treating rod-shaped material, in particular of aluminum or aluminum alloys, in a furnace and subsequently dividing said rod-shaped material into slugs with hot shears, the improvement comprising the step of:

selectively air-cooling or heating the material in controlled fashion as said material is passed between the furnace and the hot shears.

4,578,031
DIMENSIONALLY STABLE MOVABLE FURNACE HEARTH

Keith A. Johnson, Toledo, and Vijay M. Kamlani, Maumee, Ohio, assignors to Midland-Ross Corporation, Cleveland, Ohio

Filed Nov. 9, 1984, Ser. No. 669,682
Int. Cl.[4] F27B *9/16*; F27D *3/12, 23/00, 1/00*
U.S. Cl. 432—138 18 Claims



10. A furnace hearth having a dimensionally stable periphery, the furnace hearth comprising:

a base plate;

a plurality of anchoring plates extending upwardly from the base plate adjacent a peripheral edge thereof and disposed generally peripherally therearound;

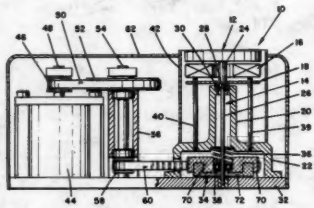
a plurality of peripheral refractory elements disposed adjacent the base plate peripheral edge and exteriorally anchored to the anchoring plates against outward movement; and,

a plurality of refractory members supported by the base plate and disposed within the peripheral refractory elements to define a workpiece supporting surface.

4,578,032
WORKPIECE HEATER

C. Fredrick Miller, 1551 E. Pacifico Ave., Anaheim, Calif. 92805

Filed Nov. 26, 1984, Ser. No. 674,790
Int. Cl.[4] F24J *3/00*; F27D *23/00, 11/00*; F27B *9/06*
U.S. Cl. 432—230 15 Claims



1. In a work heater for a wire bonding machine:

a turntable;

a non-rotatable, radiant energy turntable heater disposed at the lower side of and proximate to said turntable;

an elongated shaft fixed to said turntable and extending to said lower side of said turntable, the turntable and shaft being rotatable together about the axis of the shaft;

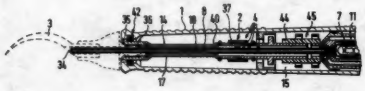
a thrust bearing supporting said shaft subjacent to said turntable and heater against axial movement in the direction away from said turntable; and

a spring positioned at the side of said bearing away from the turntable and heater and acting to urge said shaft in said direction away from the turntable, whereby displacement of said turntable is an incident to expansion and contraction of the length of said shaft.

4,578,033
TARTAR-REMOVING DENTAL HANDPIECE

Walter Mössle, Bad Waldsee, and Eugen Eibofner, Biberach, both of Fed. Rep. of Germany, assignors to Kaltenbach & Voight GmbH & Co., Biberach, Fed. Rep. of Germany

Filed Jul. 26, 1984, Ser. No. 634,784
Claims priority, application Fed. Rep. of Germany, Aug. 8, 1983, 3328604
Int. Cl.[4] A61C *3/00*
U.S. Cl. 433—29 28 Claims

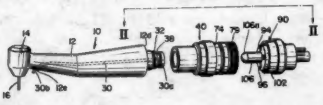


1. In a tartar-removing dental handpiece, including an elongated gripping sleeve; a vibratable tartar-removing instrument arranged at one end of said gripping sleeve; a pneumatically operated vibration generator arranged within said gripping sleeve and connected with said tartar-removing instrument to transmit vibrations thereto; media supply conduits in said gripping sleeve to conduct media therethrough; and coupling means at the end of said gripping sleeve distal from said instrument for connecting the media supply conduits with media sources; said media supply conduits including a compressed-air conduit for conducting compressed air from the coupling means to the vibration generator; the improvement comprising: said medium supply conduits further include a forward, fiber optic light conductor extending through the compressed-air conduit, and having a forward end directed towards said tartar-removing instrument; and light supplying means arranged at the end of the coupling means toward the instrument for supplying light to a rearward end of the forward light conductor.

4,578,034
DENTAL HANDPIECE HAVING AN OPTICAL FIBERSCOPE

Yuichi Shibata, and Tadashi Baba, both of Kanuma, Japan, assignors to Nakanishi Dental Mfg. Co., Ltd., Kanuma, Japan

Filed Aug. 31, 1984, Ser. No. 646,210
Claims priority, application Japan, Aug. 31, 1983, 58-134597[U]
Int. Cl.[4] A61C *3/00*
U.S. Cl. 433—29 2 Claims



1. A dental handpiece for connection to a dental unit, comprising:

a handle portion having a power head assembly integrally supported on the front end of said handle portion, said power head assembly having therein an air turbine for driving a dental tool; a base cylindrical member located in the cylindrical hollow interior of said handle portion, said base cylindrical member having a first axial central passage with a fiberscope therein, a second side passage for supplying air under pressure to said air turbine, a third side passage for supplying water to the dental tool and a fourth passage for exhaust of air from said air turbine, the rear

end of said fiberscope projecting slightly out of the rear end portion of said first central passage, each of said second, third and fourth passages extending parallel to said axial central passage and being equally peripherally spaced therearound;

a middle connecting means having an outer cylindrical member and an inner cylindrical member which is integrally fitted into said outer cylindrical member, said inner cylindrical member having a large diameter front hollow portion fitting into said handle portion around said base cylindrical member in fluid tight engagement therewith and a small diameter rear hollow portion into which the rear end of said base cylindrical member extends, three further side passages extending parallel to the axis of said cylindrical members in peripheral positions corresponding to the peripheral positions of said three side passages in said base cylindrical member and being in fluid communication with said three side passages, and releasable locking means engaging said base cylindrical member for locking said middle connecting means to said handle portion; and

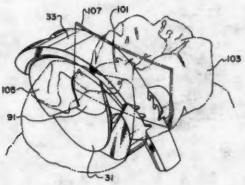
a rear connecting means having a first axial central passage, a still further second side passage for supplying air under pressure, a still further third side passage for supplying water, and a still further fourth side passage for exhaust, said still further passages being aligned with corresponding ones of said further side passages in said middle connecting means, a stop element projecting radially from the outer periphery of said rear connecting means, a jack in said central passage, a lampholder and a lamp inserted into said jack, said lamp projecting into the rear hollow portion of said middle connecting means adjacent the end of said fiberscope, and a cap having internal threads and rotatably mounted around the outer periphery of said rear connecting means over said stop and threadedly engaged with the rear end of said middle connecting means for firmly attaching said rear connecting means to said middle connecting means.

4,578,035

DENTAL WEDGE

Darrell K. Pruitt, 2817 Stark, Suite A, Fort Worth, Tex. 76112

Filed May 20, 1985, Ser. No. 735,949
Int. Cl.[4] A61C *7/00*
U.S. Cl. 433—149 **18 Claims**



1. An apparatus for use for dental restoration, comprising:

two flexible members, one being defined as a gingival member and the other being defined as an occlusal member,

said gingival member having first and second ends and being generally C-shaped between said first and second ends,

said gingival member having an outer side and two other sides which extend from opposite edges of said outer side to a pointed edge where they meet each other,

said occlusal member having a first end and a second end,

said occlusal member having an outer side and two other sides which extend from opposite edges of its outer side to a pointed edge where they meet each other,

means for connecting said second end of said occlusal member to said first end of said gingival member and for connecting said first end of said occlusal member to said second end of said gingival member such that a closed loop wedge is formed by said gingival and occlusal members with their pointed edges defining a central opening,

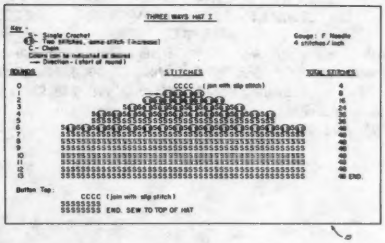
said gingival member being adapted to be inserted partially through the gingival embrasure of two adjacent teeth from its first end with its outer side facing the gum whereby the pointed edge of said occlusal member may be fitted within the occlusal embrasure of the two adjacent teeth and second end of said occlusal member connected to said first end of said gingival member and said first end of said occlusal member connected to said second end of said gingival member to form a closed loop wedge which fills the gingival, buccal, lingual, and occlusal embrasures between the two adjacent teeth.

4,578,036

METHOD OF INSTRUCTIONS FOR KNITTING AND CROCHETING

Estelle Leighton, 205 Graham St., Stratford, Conn. 06947

Filed Apr. 15, 1983, Ser. No. 485,198
Int. Cl.[4] G09B *19/20*
U.S. Cl. 434—95 **11 Claims**


THREE WAYS HAT 2
Key :
C : Single Crochet
(2) : Two Stitches, same stitch (Increase)
C - Chain
Colors can be indicated as desired
Direction - (start of round)
Gauge : F Needle
4 stitches / inch
ROUNDS
STITCHES
TOTAL STITCHES
CCCC (join with slip stitch)
Button Top :
CCCC (join with slip stitch)
END. SEW TO TOP OF HAT

1. A method for use in preparing knitted and crocheted articles constructed of more than one type of stitch comprising the steps of:

forming a pattern of the article,

displaying on that pattern the symbols representative of each type of stitch to be formed, and indicating on said pattern the position, number, and character of each stitch.

4,578,037

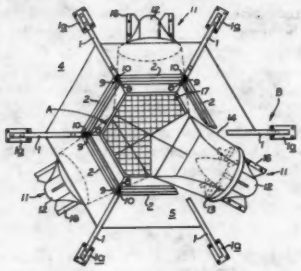
SKYDIVING SIMULATOR

Alexander Macangus, 16 Chapel Street, and Thomas Dickson, 4 Burgess Terrace, both of Edinburgh, Scotland

PCT No. PCT/GB82/00298, § 371 Date Jun. 16, 1983, § 102(e) Date Jun. 16, 1983, PCT Pub. No. WO83/01380, PCT Pub. Date Apr. 28, 1983
PCT Filed Oct. 20, 1982, Ser. No. 511,348
Claims priority, application United Kingdom, Oct. 20, 1981, 8131665; Dec. 4, 1981, 8136577
Int. Cl.[4] G01M *9/00;* A63B *71/02;* A63G *31/16*
U.S. Cl. 434—258 **26 Claims**

1. A skydiving simulator comprising a framework (B), a flying chamber (A) supported within the framework (B), the flying chamber (A) having an air inlet at the base thereof and an air outlet at the top thereof, and means (11) for producing an upward stream of air within the flying chamber (A), wherein the flying chamber (A) is made of tensioned sheet material (6), and the flying chamber (A) having a lower section (A'), whose side walls (6*a*) are substantially vertical about a central longitudinal axis, and the flying chamber (A) further having an upper section (A''), concentrically mounted about the central longitudinal axis and having a lower end coincident with the upper end of the lower section (A'), and the side walls (6*b*) of the upper section (A'') inclined at a small angle to the vertical and

divergent with respect to the central longitudinal axis, whereby the upper end of the upper section (A″) has a larger



cross-sectional area than the lower end of the upper section (A″).

4,578,038

ELONGATED PROPELLING MEANS FOR MANUALLY MOVING A SAILING CRAFT OVER THE WATER SURFACE

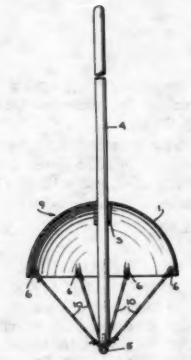
Hendrik Lenten, Zijlroede 20, 8604 BB Sneek, Netherlands

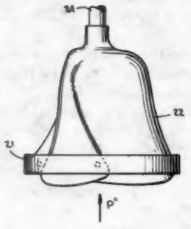
Continuation of Ser. No. 507,011, Jun. 23, 1983, abandoned. This application Jun. 17, 1985, Ser. No. 745,373

Claims priority, application Netherlands, Aug. 3, 1982, 8203091; Aug. 18, 1982, 8203246

Int. Cl.⁴ B63H *1/32*

U.S. Cl. 440—19 **6 Claims**





1. A thrust device for manually propelling a water craft over the surface of the water, the thrust device including an elongated pole member and thrust means disposed adjacent to one end of the pole member, the thrust means comprising:

a flexible substantially circular foil;

a tubular collar formed at the center of the substantially circular foil, the collar being fastened to the pole member at a location adjacent to but spaced from said one end of the pole member;

a plurality of elongated flexible tension members, each tension member having a first end and a second end;

means for attaching the first ends of the tension members at spaced apart locations around the circumference of the substantially circular foil; and

means for attaching the second ends of the tension members to said one end of the pole member, the lengths of the tension members being selected to hold the substantially circular foil open at a predetermined apex angle between the pole member and the foil, wherein:

the foil is made of soft plastics material and is provided with three equally spaced folds formed at the periphery of the foil and extending toward the center thereof, the plurality of tension members consist of six flexible lines attached to six locations equally spaced around the periphery of the foil, and alternate ones of the means for attaching the first ends of the tension members to the circumference of the foil are means for applying said folds to the foil; and wherein when the device is in the stored condition the folds are wrapped around the pole in a spiral direction, and the device further comprises an annular band surrounding the foil when the device is in the stored condition so as to set a spiral curve in the folds of the plastic foil to facilitate opening of the foil during a thrust stroke of the pole into the water and to facilitate collapse of the foil during a retraction stroke of the pole from the water.

4,578,039

MARINE HYDRAULIC STEERING SYSTEM CONTROL

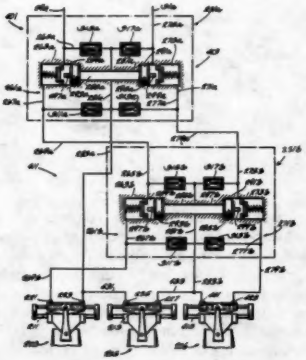
Charles B. Hall, Ingleside, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Continuation-in-part of Ser. No. 258,874, Apr. 29, 1981, Pat. No. 4,431,422. This application Dec. 1, 1983, Ser. No. 556,963

The portion of the term of this patent subsequent to Feb. 14, 2001, has been disclaimed.

Int. Cl.⁴ B63H *25/22*

U.S. Cl. 440—61 **21 Claims**



8. A hydraulic control unit for a marine installation comprising a helm station comprising a pump including first and second pump discharge ports, and means for selectively and alternatively delivering fluid under pressure from the pump to the first and second pump discharge ports, a plurality of steerable propulsion units, a corresponding plurality of hydraulic steering cylinders respectively connected to each of said propulsion

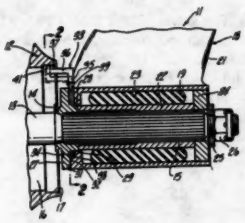
units and including respective first ports which, when subject to fluid under pressure, tend to steer the propulsion units in one direction and including respective second ports which, when subject to fluid under pressure, tend to steer the propulsion units in the opposite direction, a first tie line connecting the first steering cylinder second port and the second steering cylinder first port, additional tie lines connecting successive steering cylinder second ports and the following steering cylinder first ports, said hydraulic control unit including a first hydraulic fluid line adapted for communication between the first pump discharge port and the first steering cylinder first port, a second hydraulic fluid line adapted for communication between the second pump discharge port and the last steering cylinder second port, and means adapted for communication with each of the tie lines and operably connected to said first and second fluid lines, and operable, during the presence of fluid under pressure supplied by the pump in one of the first and second fluid lines, and in response to the absence of fluid under pressure in any one of the tie lines, for preventing propulsion unit steering movement.

4,578,040

FISH LINE ENTERING PREVENTION DEVICE FOR MARINE PROPELLER

Yoshitsugu Sumino, and Hiroshi Harada, both of Shizuoka, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Japan

Filed May 29, 1984, Ser. No. 614,880
Claims priority, application Japan, May 30, 1983, 58-94107
Int. Cl.⁴ B63H *1/28*
U.S. Cl. 440—73 **4 Claims**



1. In a fish line cutter or the like for a marine outboard drive having a lower unit housing defining a rearwardly opening annular recess, a propeller shaft journaled in said lower unit housing and having a portion juxtaposed to said annular recess, a propeller affixed for rotation with said propeller shaft and juxtaposed to said recess, and a fish line cutting device affixed for rotation with said propeller shaft and having a plurality of circumferentially spaced cutting edges disposed rearwardly of and in proximity to said recess, each of said cutting edges further having a portion extending axially forwardly at least in part into said recess and spaced radially inwardly from said recess to define a gap, the improvement comprising at least one area on said cutting device extending radially outwardly from each of said portions axially within said annular recess and in close proximity to the portion of said housing defining said recess to define a space sized to prevent the forward entry of fish line past said cutting edges and said gap into said recess.

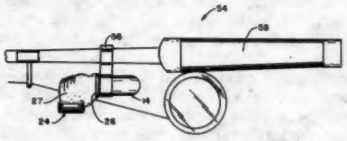
4,578,041

WATER ACTUATED INFLATABLE FLOAT DEVICE

Lawrence F. Heitkamp, III, Chesterfield, and John J. Heitkamp, Jr., Union, both of Mo., assignors to Trip-Saver Inc., Chesterfield, Mo.

Filed Aug. 20, 1984, Ser. No. 642,390
Int. Cl.⁴ B63B *22/22*
U.S. Cl. 441—30 **6 Claims**

1. A flotation device comprising an inflatable member having an inlet opening therein, a compressed gas source including a container therefor with a port therein, means normally sealing said port, a body member having a bore extending therethrough, means connecting the port of the compressed gas container to the body member adjacent the bore and in registration therewith in position so that the means closing the port extends across said bore, a piston member positioned in the bore and movable therein between a first position engaging the means sealably closing the port in the compressed gas container and a second position spaced from said sealing means, said piston member having means thereon capable of rupturing the means sealably closing the port in the compressed gas container in the first position thereof, an outlet port through the body member communicating the bore with the inlet opening of the infaltable member when said piston member is in the second position thereof, piston engaging means positioned on said body member and movable between one position wherein said piston engaging means retains said piston member in the first position thereof and another position wherein said piston



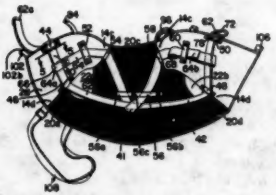
engaging means allows said piston member to be moved to said second position thereof, liquid responsive means adaptable for retaining said piston engaging means in the one position thereof and adaptable for releasing said piston engaging means when exposed to a liquid thereby enabling the compressed gas in the compressed gas container to move the piston from said first position to said second position thereby establishing communication between the compressed gas in the compressed gas container and the inflatable member by way of the bore and the outlet port in the body member, liquid flow regulator means comprising a non-permeable cover member placed over and around said device, said cover member having a first opening therein to allow said inflatable member to resiliently pass therethrough and a second opening to allow the port of said compressed gas container to extend therethrough to adjacent the bore, and means adjacent said second opening to regulate the amount of liquid that can pass therethrough.

4,578,042

SAFETY HARNESS PERSONAL FLOTATION DEVICE

Karla R. Evert, St. Cloud, Minn., assignor to Stearns Manufacturing Company, St. Cloud, Minn.

Filed Mar. 4, 1983, Ser. No. 472,091
Int. Cl.⁴ B63C *9/08*
U.S. Cl. 441—117 **10 Claims**



1. A safety harness personal flotation device to be worn on the body of an individual which comprises:

(a) a buoyant body portion comprising a front section having a top zone and a bottom zone and right-front and a left-front section, and a back section having a top zone and a bottom zone, the back section being cooperatively connected to the front section at both the top zones and the bottom zones, at least one of the front and back sections

comprising a mass of buoyant material, the body portion also having an inside and an outside surface;

(b) a floating harness formed of webbing carried adjacent to the inside surface but not otherwise significantly permanently attached to the body portion;

(c) means for carrying the floating harness adjacent to the inside surface, comprising:

(i) a first strap, the first strap having first and second ends, the ends being attached to the inside surface of the body portion such that the first strap resides in a substantially horizontal alignment within the top zone of the right front section;

(ii) a second strap, the second strap having first and second ends, the ends being attached to the inside surface of the body portion such that the second strap resides in a substantially horizontal alignment near an intersection between the top zone of the right front section and the back section;

(iii) a third strap, the third strap having first and second ends, the ends being attached to the inside surface of the body portion such that the third strap resides in a substantially horizontal alignment near an intersection between the top zone and the bottom zone of the back section, the third strap having sufficient length to permit the webbing to pass twice between the third strap and the inside surface while the webbing resides in a substantially single plane;

(iv) a fourth strap, the fourth strap having first and second ends, the ends being attached to the inside surface of the body portion such that the fourth strap resides in a substantially horizontal alignment near an intersection between the top zone of the left front section and the back section; and

(v) a fifth strap, the fifth strap having first and second ends, the ends being attached to the inside surface of the body portion such that the fifth strap resides in a substantially horizontal alignment with the top zone of the left front section, such that the webbing is threaded sequentially beneath the first strap, the second strap, twice through the third strap, the fourth strap and the fifth strap so as to allow horizontal and vertical movement of the webbing beneath the straps;

(d) a ring-like member connected to the floating harness and readily accessible for attachment to a rescue line, located between the right-front and the left-front section, wherein the device has sufficient integrity to support the dead weight of an individual wearing the device when the device is attached at the ring-like member to a rescue line and the individual is pulled into the air by the line, and wherein when the device is worn by an individual, the ring-like member is attached to a rescue line, and the rescue line pulls the individual into the air, stress caused by the dead weight of the individual will be borne substanitally by the floating harness rather than by the body portion.

4,578,043

METHOD AND APPARATUS FOR MANUFACTURING LIGHT BULB WITH BEAD SEALING GAS

Toru Teshima; Masanobu Aizawa; Mitsunari Yoshida, all of Yokohama; Toshiyuki Shima, Kawasaki, and Masakazu Takeda, Tokyo, all of Japan, assignors to Stanley Electric Co., Ltd., Tokyo, Japan

Filed Feb. 26, 1985, Ser. No. 705,747

Claims priority, application Japan, Mar. 5, 1984, 59-41718

Int. Cl.[4] H01J *9/18*

U.S. Cl. 445—40 **21 Claims**

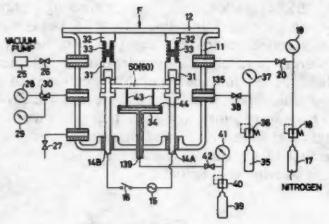
1. A method of manufacturing a light bulb with a bead sealing gas therein, comprising:

setting a bead mount and a glass bulb in a recess in an upper surface of a heater arranged inside a hermetically sealed chamber;

evacuating said chamber;

supplying a first gas to the interior of said chamber at a predetermined pressure after said chamber is evacuated;

supplying a second gas, which includes at least one sealing gas, into a space between said glass bulb and said bead mount at a pressure higher than that of said first gas to exhaust said first gas from said space between said glass bulb and said bead mount to substitute said second gas for said first gas in said space; and



energizing said heater after gas substitution is performed or while said gas substitution is being performed, so that the bead of said bead mount and an edge portion of said glass bulb are heated and melted to seal together said glass bulb and said bead mount to form a sealed bulb with said second gas sealed therein.

4,578,044

MAGNETICALLY MOVABLE MODEL TOY

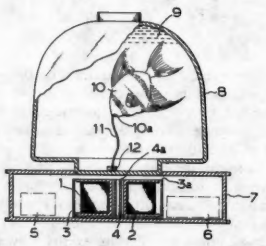
Shigeru Saitoh, Tokyo, Japan, assignor to Masudaya Corporation Limited, Tokyo, Japan

Filed Jul. 30, 1984, Ser. No. 635,897

Claims priority, application Japan, Jan. 30, 1984, 59-13515

Int. Cl.[4] A63H *33/26, 3/52, 13/00*

U.S. Cl. 446—134 **19 Claims**



1. A toy, comprising:

a vessel having a base portion;

a fluid contained within said vessel;

a buoyant moveable model buoyantly supported by said fluid;

means for generating and alternating a magnetic field in response to a direct current;

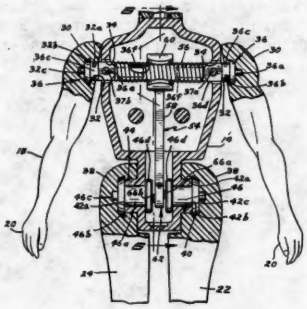
a permanent magnet located on said base portion, disposed in said generated magnetic field and moveable in response to the latter; and

means for transmitting the movement of said permanent magnet in said generated magnetic field to said moveable model, said transmitting means including a string having ends respectively attached to said permanent magnet and said moveable model so that movement of said permanent magnet in said generated magnetic field causes said string to move thereby transmitting said movement to said moveable model.

4,578,045
ACTION FIGURE WITH LEG MOVEMENT DERIVED FROM ARM MOVEMENT

John F. Mayer, Fort Thomas, Ky.; Nick H. Langdon, Cincinnati, Ohio; Stuart A. Cook, New Richmond, Ohio; L. Todd Nicholson, Cincinnati, Ohio, and John R. Belcher, Opelika, Ala., assignors to CPG Products Corp., Minneapolis, Minn.

Filed Jan. 30, 1984, Ser. No. 574,826
Int. Cl.[4] A63H *3/20*
U.S. Cl. 446—330 19 Claims



1. A toy action figure comprising a hollow torso, first and second arms, first means mounting said first arm to said torso for lateral rocking movement about a first axis, first and second legs, second means mounting said first leg to said torso for pivotal movement about a second axis, and an actuating mechanism within said torso connecting said first arm to said first leg for causing the pivotal movement of said first leg about said second axis by transmitting movement of said first arm to said first leg when said first arm is rocked about said first axis in a lateral direction relative to one side of said torso, said actuating mechanism including coil spring means having one end portion thereof coupled to said first means and further including third means coupled to said coil spring means at a location spaced from said first means, said spring means and said third means connecting said first arm to said first leg through said first and second means.

4,578,046
REVERSIBLY TRANSFORMABLE TOY BLOCK ASSEMBLY

Kouzin Ohno, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan

Filed Mar. 18, 1983, Ser. No. 476,822
Claims priority, application Japan, Mar. 24, 1982, 57-41463[U]
Int. Cl.[4] A63H *3/46, 17/00*
U.S. Cl. 446—376 12 Claims

1. A reversibly transformable toy block assembly, comprising:

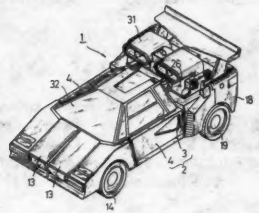
a frame means for supporting said toy block assembly;

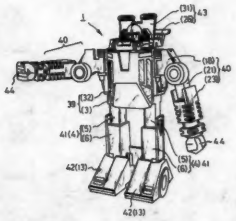
a pair of first movable elements mounted on both sides of said frame means so as to be shiftable between a first position and a second position;

a second movable element mounted on said frame means so as to be shiftable between a third position and a fourth position;

a pair of third movable elements slidably mounted on said frame means so as to be slidable between a fifth position and a sixth position; and

a pair of fourth movable elements each attached to the end portion of each said third movable elements so as to be movable between a seventh position and an eighth position; wherein said toy block assembly forms a toy vehicle when said toy first, second, third and fourth movable elements are respectively in the first, third, fifth and seventh positions and said toy block assembly forms a toy humanoid robot different in appearance from said toy vehicle when the first to fourth movable elements are respectively in the second, fourth, sixth and eighth positions, when said toy block assembly is transformed into



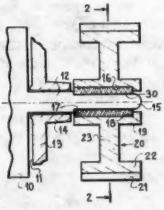


said toy robot, said frame means forms a trunk of said toy robot and said first to fourth movable elements respectively form arms, a head, legs and feet of said toy robot, each of the elements being permanently connected together as a unitary toy assembly.

4,578,047
STATION-SELECTING DEVICE FOR A RADIO RECEIVER

Guy Pissot, Bressolles, France, assignor to Thomson-Brandt, Paris, France

Filed Nov. 14, 1983, Ser. No. 551,531
Claims priority, application France, Nov. 16, 1982, 82 19144
Int. Cl.[4] F16D *7/02;* F16H *35/18, 55/00*
U.S. Cl. 464—30 5 Claims



1. A selecting device for tuning a radio receiver comprising:

a rotatable control knob;

a shaft fastening said control knob to one end thereof; a cylindrical sleeve which is elastic in the radial direction, frictionally and movably mounted on said shaft;

a rigid driven member fixed to an outer surface of said sleeve for rotating between two end positions by the rotation of said knob;

a part driven by said driven member; and

said sleeve absorbing radial forces and compensating for

play between the shaft and the driven member, and between the driven member and the part;

the value of the coefficient of friction between the shaft and the sleeve being sufficiently high to produce a driving movement of the driven member when the member is located between its end positions and sufficiently low to produce relative rotation of the shaft in the sleeve when said driven member is stopped at an end position.

4,578,048

SLIDABLE TYPE CONSTANT VELOCITY UNIVERSAL JOINT

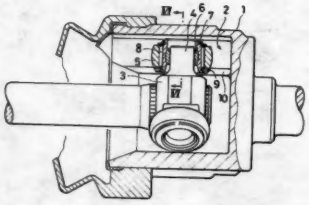
Seiichi Hirai, Saitama; Akira Nishizawa, Asaka, and Nobuyuki Otsuka, Kawagoe, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 6, 1981, Ser. No. 236,914

Claims priority, application Japan, Feb. 25, 1980, 55-22377[U]

Int. Cl.⁴ F16D *3/20*

U.S. Cl. 464—111 **25 Claims**



11. A constant velocity universal joint comprising inner and outer rotatable members having respective longitudinal axes of rotation and being relatively pivotable with respect to one another, trunnions extending radially outwards on said inner member, said outer rotatable member having longitudinal grooves therein, one for each trunnion, each of said grooves having opposite curved side walls, roller means on said trunnions rollably supported in said grooves for axial travel therein, said roller means comprising a roller rotatably mounted on each said trunnion for universal pivotal movement and being slidable axially thereof, said roller having a curved outer surface complimentary to the curved side walls of the respective groove and being rollably engaged therein for axial travel in said groove, said roller being undersized relative to the maximum width of the groove measured between the side walls to provide a clearance in said groove so that with the roller disposed at the maximum width of the groove the outer surface of the roller does not contact both of the respective side walls of the groove simultaneously, and abutment means carried by each of said roller means for travel therewith as said roller means travels in the respective groove and on the respective trunnion said abutment means being positioned for engaging the side walls of the respective said groove to limit axial travel of the roller means on the trunnion and preserve the clearance of the roller in the groove when the roller means slides axially on the trunnion.

4,578,049

PULLEY DEVICE

Yoshitaka Sakai, Nagoya, Japan, assignor to Sakai Manufacturing Co., Ltd., Nagoya, Japan

Filed Feb. 20, 1985, Ser. No. 703,573

Claims priority, application Japan, Sep. 18, 1984, 59-195076

Int. Cl.⁴ F16H *55/56*

U.S. Cl. 474—8 **5 Claims**

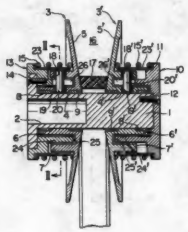
1. A pulley device comprising:

a driving shaft;

a pair of discs each having a centre opening through which said disc is mounted on said driving shaft for slidable movement along an axis of said driving shaft, each of said discs being provided at one end thereof with a truncated cone surface and at the other end with concentric tubular portions, and axes of said concentric tubular portions being concentrated to an axis of said disc;

at least a pair of roll pins each radially extending through aligned bores formed in peripheral walls of said concentric tubular portions of respective discs, said roll pin being restrained from a movement along an axis thereof;

oilless bearing means interposed between an outer periphery of the respective roll pin and an inner periphery of said aligned bores in said concentric tubular portions for rotation of said roll pin about the axis thereof as well as for slidable movement of said roll pin along the axis thereof;



a pair or urging means each interposed between said the other end of said disc and an end member fixed to said shaft, each of said urging means urging one of said disc toward the other one to define between said truncated cone surface thereof an annular groove for a driving belt; and

a pair of cylindrical portions each fixed to said shaft and able to be loosely accommodated in an annular space defined by said concentric tubular portions of the respective discs, said cylindrical portion being provided at a peripheral wall thereof with at least one axial notch having a circumferential width substantially equal to a diameter of said roll pin for movement of said roll pin along the axis of said driving shaft.

4,578,050

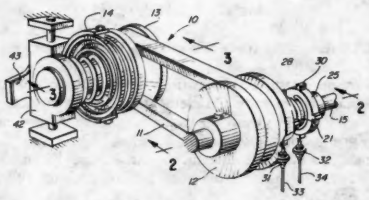
BELT-TYPE TORQUE CONTROL SYSTEM

Hiroshi Takano, Hyogo, Japan, assignor to Mitsuboshi Belting Ltd., Kobe, Japan

Filed May 8, 1985, Ser. No. 731,997

Int. Cl.⁴ F16H *11/06*

U.S. Cl. 474—17 **16 Claims**



1. In a drive system having a first variable speed pulley, a second variable speed pulley having first and second pulley halves defining axially opposite radially inwardly converging belt groove sidewalls coaxially mounted to a shaft, means for fixedly securing one of the pulley halves to said shaft, means for rotatably, axially slidably mounting the second pulley half to said shaft, and spring means associated with said pulley halves for resiliently biasing said pulley halves to have a prese-

lected minimum spacing between the belt groove sidewalls and causing an increase in the spacing between said sidewalls as a result of said second pulley half being rotatively displaced about said shaft as a result of drive forces developed between the belt and said second pulley half, and a belt entrained about said pulleys to provide a driving connection therebetween, the improvement comprising:

electrical means for sensing the angular displacement between said fixed first and movable second pulley halves; and

adjusting means for adjusting said first pulley effectively to maintain said angular displacement within a preselected range.

4,578,051

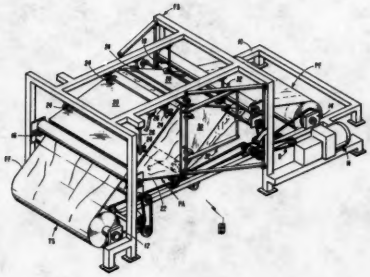
FILM TUBE GUSSET FORMING MACHINE

Wayne F. Everman, Cedar Falls, Iowa, assignor to Container Corporation of America, Chicago, Ill.

Filed Feb. 25, 1985, Ser. No. 705,325

Int. Cl.[4] B31B *1/12, 1/36*

U.S. Cl. 493—8 **10 Claims**



1. A machine for converting tubular plastic film from flat fold to pleated fold cross section, comprising:

(a) a frame;

(b) first and second film holding means mounted on said frame and spaced from each other for holding tubular plastic film in flat fold condition and pleated fold condition, respectively;

(c) a film pleat forming assembly mounted on said frame intermediate said first and second film holding means;

(d) said pleat forming assembly including:

(i) first and second sets of nip rolls spaced from each other adjacent said first and second film holding means, respectively;

(ii) means for advancing said film between said sets of nip rolls;

(iii) means for inflating that portion of the film passing between said sets of nip rolls;

(iv) means for maintaining said inflated film in a specific shape;

(v) means for forming pleats or gussets in opposite sides of said film before said film enters said second set of nip rolls;

(e) said inflating means including an air filled container positioned within said tube of film between said sets of nip rolls and having a valve including a radio receiver for operating same;

(f) a radio transmitter located without said tube for transmitting signals to said valve operating receiver.

2. A method for converting tubular plastic film from flat fold to pleated fold cross section, comprising:

(a) providing a length of plastic film in the form of a tube;

(b) inserting into said length of said tubular film a container of air having a radio controlled valve for releasing from said container a sufficient amount of air to inflate said length of tubular film to the desired degree;

(c) providing outside of said length of tubular film a radio for controlling said valve;

(d) confining opposite ends of a length of said film between first and second said sets of nip rolls;

(e) inflating said length of film between said sets of nip rolls through said radio controlled container valve;

(f) advancing said length of film between said sets of nip rolls;

(g) while said length of film is being advanced:

(i) maintaining a predetermined contour therefor by engaging upper and lower surfaces thereof with forming elements;

(ii) forming gussets therein by engaging the sides thereof with gusset forming elements.

4,578,052

METHOD AND APPARATUS TO DETERMINE FOLDING DEVIATIONS

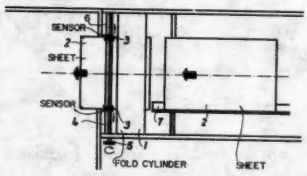
Andreas Engel, Liebertwolkwitz; Frank Schumann, Machern; Werner Stiefel, and Reinhold Freistedt, both of Rückmarsdorf, all of German Democratic Rep., assignors to VEB Kombinat Polygraph "Werner Lamberz" Leipzig, Leipzig, German Democratic Rep.

Filed Sep. 15, 1982, Ser. No. 418,129

Claims priority, application German Democratic Rep., Nov. 27, 1981, 235195

Int. Cl.[4] B31B *49/00*; B31F *1/00*

U.S. Cl. 493—11 **14 Claims**



1. Method for determining folding deviations from desired positions of folds in a material having a given print format, comprising marking a plurality of sheets of material to be folded with markings according to the print format, said markings having determined spacings from the position of the material at which it was desired that a fold be made, folding said sheets of material inside a folding machine and then sensing the respective said markings with sensors to obtain the position information of said markings, electronically evaluating the obtained position information to determine the deviation of the folding from the desired positions thereof, the step of electronic evaluation of the obtained position information comprising determining the statistical characteristics typical for the distribution of the folding deviations values, such as ranges of folding deviation values and standard deviation values and comparing said deviation to reference values for the determination of systematic folding deviations, said systematic folding deviations being dependent on the setting of the folding machine, whereby the folding machine may be adjusted in accordance with said systematic folding deviations to minimize folding deviations in subsequently folded sheets of material.

4,578,053

TOBACCO-SMOKE FILTERS

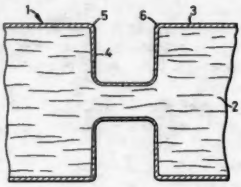
John A. Luke, Eastleigh, England, assignor to British-American Tobacco Company Limited, London, England

Filed Jan. 16, 1984, Ser. No. 570,829

Claims priority, application United Kingdom, Jan. 26, 1983, 8302058

Int. Cl.[4] A24C *5/50*

U.S. Cl. 493—45 2 Claims



1. A method of manufacture of filter rod which comprises feeding filtration material and plugwrap, being a thermally mouldable paperlike material contains theomaplastic material in the range of 25 to 95 percent of the plug wrap, continuously to a rod maker, and bringing the rod into contact with a heated moulding means, whereby an impression is produced in the peripheral surface of said plugwrap and the impressed part of the plugwrap is transformed from said paperlike material to a film-like material of reduced permeability whilst the continuity of said plugwrap is preserved.

4,578,054

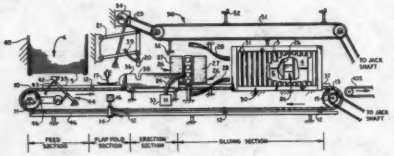
CARTON ERECTION AND SEALING APPARATUS

Robert M. Herrin, P.O. Box 4509, Albany, Ga. 31706

Filed Nov. 17, 1983, Ser. No. 552,678

Int. Cl.[4] B31B *1/06, 3/00, 5/00*

U.S. Cl. 493—126 11 Claims



1. Apparatus for erecting and sealing flattened cardboard cartons, said cartons having a pair of major flaps and a pair of minor flaps, comprising:

a. conveyor means for moving an initially flattened carton forward at a constant rate, said flattened carton disposed on said conveyor means in a horizontal plane;

b. flat folding means cooperating with said conveyor means for folding a first pair of a minor flap and a major flat upward and a second pair of a minor flap and a major flap downward;

c. mechanical clamping means for grasping both sides of the upward folded major flap;

d. erecting means for drawing said clamping means upward as said conveyor means moves said carton forward thereby opening said carton, said erecting means releasing said clamping means when said carton is fully open;

e. means maintaining said container in an erect condition during said movement,

f. glue applying means adjacent said conveyor means for applying glue to said minor flaps as said carton moves past said glue applying means;

g. major flap folding means for folding said upward and downward folded flaps inward and in contact with said glue on said minor flaps;

h. platen means moving in said direction and at the same rate as said conveyor means, said platen means extending into said carton for contacting the inside surfaces of said minor flaps after folding in of said major flaps; and

i. platen backing means adjacent said conveying means for contacting said folded in major flaps as said conveying means moves said carton along said platen backing means, said platen means applying pressure to said minor and major flaps against said platen backing means.

4,578,055

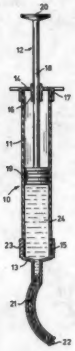
CONTROLLED DIFFUSION MEDICAMENT APPLICATOR

Dan E. Fischer, 1345 E. 3900 South, Salt Lake City, Utah 84016

Continuation of Ser. No. 60,382, Jul. 25, 1979, abandoned, which is a continuation-in-part of Ser. No. 799,168, May 23, 1977, abandoned. This application Apr. 26, 1984, Ser. No. 604,029

Int. Cl.[4] A61B *10/00*

U.S. Cl. 604—2 17 Claims



1. An apparatus for use in applying a hemostatic agent to bleeding gingival tissue during dental procedures, comprising:

reservoir means for holding a quantity of hemostatic agent;

means for applying the hemostatic agent at a desired location of the gingival tissue, the proximal end of the applying means being in communication with the reservoir means such that the hemostatic agent is applied under hydraulic pressure to the desired location by the distal end of the applying means;

porous means secured to the applying means such that a portion of the porous means extend sufficiently beyond the distal end so as to provide for at least partial sealing of the distal end of the applying means when pressed against the gingival tissue, thereby causing the hemostatic agent to be forced into said tissue by the hydraulic pressure of the applying means, and the porous means further protecting the gingival tissue from damage by the applying means as the tissue is mechanically burnished during application of the hemostatic agent; and

means for controlled dispensing of the hemostatic agent under hydraulic pressure from the reservoir means to the distal end of the applying means.

4,578,056

PATIENT PHOTOPHERESIS TREATMENT APPARATUS AND METHOD

Martin J. King, Largo, and Vernon H. Troutner, St. Petersburg, both of Fla., assignors to Extracorporeal Medical Specialties, Inc., King of Prussia, Pa.

Filed Oct. 29, 1984, Ser. No. 665,833

Int. Cl.[4] A61M *37/00*

U.S. Cl. 604—6 12 Claims

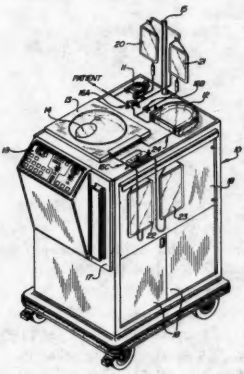
1. Apparatus for use in a patient treatment system wherein

blood, in contact with a photoactivatable reagent, is collected from said patient, centrifuged to provide a leukocyte enriched portion which is irradiated for activating said reagent, all portions including the irradiated portion being returned to said patient, said apparatus comprising:

infusion pump means for controlling the addition of anticoagulation agent means to said patient's blood;

receiving means for receiving an irradiation cassette adapted to provide said photoactivating irradiation;

continuous centrifuge means for separating patient blood into at least a plasma portion and a leukocyte enriched portion, said centrifuge means including a revolution sensor for monitoring rotation;



blood pump means for pumping blood from said patient to said centrifuge, said blood pump means including revolution counter means and having known pumping characteristics whereby blood volume pumped may be determined;

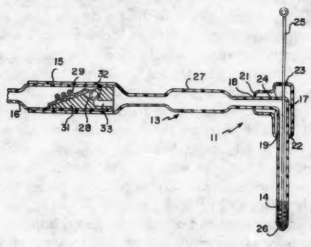
central control means for regulating said infusion pump means, said receiving means, said continuous centrifuge means and said blood pump means whereby blood withdrawn from said patient, is contacted with said anticoagulant agent means, separated into a leukocyte enriched portion which, while in contact with said photoactivatable reagent, is irradiated prior to its return to the patient.

4,578,057

VENTRICULAR RIGHT ANGLE CONNECTOR AND SYSTEM

Marvin L. Sussman, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Aug. 31, 1984, Ser. No. 645,849
Int. Cl.[4] A61F *2/20*
U.S. Cl. 604—9 **9 Claims**



1. A right angle connector, catheter and hydrocephalus valve system, comprising:

a tubing assembly having a ventricular catheter at its distal end, said tubing assembly including a cerebrospinal fluid drainage valve mounted therealong at a location caudal of said ventricular catheter, said tubing assembly also including a tubing portion that is cephalic of said cerebrospinal fluid drainage valve;

right angle connector means for insertingly receiving said ventricular catheter and at least a portion of said cephalic tubing portion, said right angle connector means being a substantially elbow-shaped tubular member having a passageway therethrough, said passageway having an internal cross-section that is greater than the external cross-section of the ventricular catheter and of the cephalic tubing portion, said passageway including a distal end opening and a proximal end opening, said right angle connector means and its said passageway being substantially closed and including means for substantially preventing leakage of cerebrospinal fluid from said right angle connector;

a self-sealing port is included on said right angle connector means, said self-sealing port being in generally straight-line alignment with said distal end opening of the passageway of the right angle connector means; and

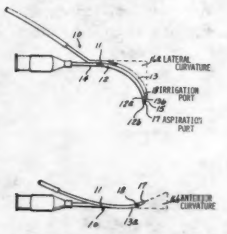
stylet means for puncturing passage through said self-sealing port, for puncturing passage through said cephalic tubing portion at a location that is caudal of said ventricular catheter and for inserting passage into said ventricular catheter, and said self-sealing port closes upon removal of said stylet means from the right angle connector for substantially preventing cerebrospinal fluid leakage therethrough and out of said right angle connector.

4,578,058

INTRAOCULAR CATHETER APPARATUS AND METHOD OF USE

Stanley C. Grandon, 4529 Tanbark, Bloomfield Hills, Mich. 48013

Filed Apr. 2, 1984, Ser. No. 595,676
Int. Cl.[4] A61M *1/00*
U.S. Cl. 604—27 **10 Claims**



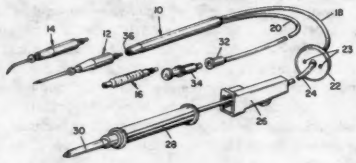
1. Surgical catheter apparatus for catheterized intraocular irrigation and aspiration of an aphakic eye, having an axially elongated tubular body along a longitudinal axis comprising an aspiration tube and an irrigation tube in double-barrel side by side relation for transport of fluid therein, each tube having a proximal portion and a distal portion, said distal portion with respect to the longitudinal axis of the proximal portion having a permanently fixed curved portion forming a compound curve means comprising both lateral curvature means and transverse curvature means with respect to the longitudinal axis, the degree of curvature means being such that during aspiration the curved extremity of the distal portion of the aspiration tube engages the capsular cortex behind the iris in the posterior chamber in the capsule of a aphakic eye, said distal portion including an aspiration port and an irrigation port, the aspiration port being located at the extreme distal portion and being spaced apart on the curvature in a direction facing away from the irrigation port on the distal end of the aspiration tube.

4,578,059

EXTRA-CAPSULAR CATARACT SURGERY SYSTEM

Robert N. Fabricant, 285 E. 24th St., Upland, Calif. 91786, and Ronald J. Gangemi, 14625 Youbet Rd., Grass Valley, Calif. 94545

Filed May 7, 1984, Ser. No. 607,411
Int. Cl.[4] A61M 3/00, 35/00
U.S. Cl. 604—43 13 Claims



1. In a system for use in extra-capsular cataract surgery, the combination comprising:

a handpiece having first and second longitudinally extending passageways for aspiration and irrigation purposes;

a device attachable to said handpiece in axial alignment therewith, said device having a main body portion with a bore therein and having a first generally rigid cannula secured thereto generally centrally relative to said bore for providing a first flow passage for communication with said first passageway of said handpiece, said first cannula having first port means adjacent the tip thereof; and

a piston member rotatably and slidably assembled within said bore on said main body portion, said piston member having a second generally flexible cannula secured thereto in an axial direction, said second cannula being configured for being assembled on said first cannula with the terminal end of said second cannula being in generally sealing relation, said second cannula having port means adjacent the terminal and thereof, said member and said second cannula being in flow communication with said second passageway means within said device whereby the port means of said second cannula may be displaced axially and circumferentially relative to said port means of said first cannula during use thereof.

4,578,060

WOUND DRAINAGE DEVICE

Charles M. Huck, Pottersville, N.J., and Edward W. Larrabee, Bronxville, N.Y., assignors to Howmedica, Inc., New York, N.Y.

Filed Jul. 20, 1983, Ser. No. 515,504
Int. Cl.[4] A61M 1/00
U.S. Cl. 604—133 27 Claims

1. A device for drawing fluids therein comprising:

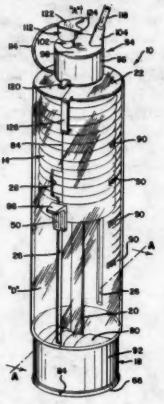
a. a housing having an end wall and an opening therein;

b. an airtight and watertight resilient container disposed within the housing and being collapsible and expandable therein;

c. means for communicating with the interior of the container;

d. means for collapsing the container within the housing; and

e. variable force means for automatically expanding the container from its collapsed state such that the combined resultant force of the variable forces provided by the container and the variable force expansion means allows for the creation of a substantially constant level of negative pressure within the container so as to provide for the drawing of fluids therein at a substantially constant level of suction, said variable force expansion means being disposed outside the container.

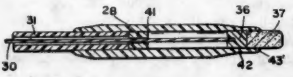


4,578,061

INJECTION CATHETER AND METHOD

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Continuation of Ser. No. 201,531, Oct. 28, 1980, which is a continuation-in-part of Ser. No. 885,263, Mar. 10, 1978, abandoned. This application Jul. 31, 1984, Ser. No. 636,239
Int. Cl.[4] A61M 5/00, 25/00
U.S. Cl. 604—164 8 Claims



1. A catheter comprising:

an elongated hollow flexible tubular member adapted to be inserted into and moved along a body duct, such as an artery,

an operating head attached to and terminating at one end of said flexible tubular member and having a side wall portion facing lateral to the longitudinal axis of said flexible tubular member,

an elongated narrow passageway extending longitudinally and laterally through said operating head and terminating at one end at an opening in said side wall of said head,

a hollow hypodermic needle having a dispensing front end with an opening therein, said needle being completely disposed and supported within said operating head and movable longitudinally through said passageway in said head from a retracted position therein whereby the dispensing end of said needle is below said opening in said side wall of said head to an extended position whereby said dispensing end of said needle projects laterally outwardly beyond the side wall of said head so as to permit said dispensing end of said needle to penetrate tissue against the side wall of said head,

first means at the other end of said elongated hollow flexible tubular member for applying a force for urging movement of said needle through said passageway in said head from said retracted position therein to said extended position lateral of said head and for returning said needle from said extended to said retracted position within said head when

said head is selectively located within a passageway of a living being,

second means for introducing a liquid into said needle and ejecting said liquid through the opening in the dispensing end of said needle into tissue penetrated by the end of said needle.

4,578,062

INTRAVENOUS CATHETER HOLDER

Paul E. Schneider, 300 N. Main St., Woodsfield, Ohio 43793

Filed Dec. 14, 1984, Ser. No. 681,801
Int. Cl.[4] A41D *1/04*; A61M *5/00*
U.S. Cl. 604—174 **1 Claim**

1. A re-usable intravenous catheter holder configured in the shape of a cut-off tank top body garment comprising:

a. an integral frontal support pouch for holding and supporting an indwelling catheter tubing and coupling, and being disposed on the garment side adjacent the chest of the patient;

b. an elastic band integrally disposed around the bottom of said holder;

c. an integral shoulder strap, on the frontal side of the garment where the catheter protrudes from the patient's chest, that may be opened or closed by a fastening means wherein said fastening means may be comprised of one of:

i. garment snaps;

ii buttons; or

iii. hook and loop fasteners; and

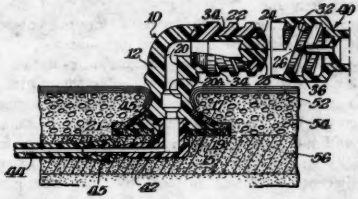
d. a second elastic band integrally disposed along the open lip of said support pouch to maintain the shape thereof.

4,578,063

CENTRAL VENOUS CATHETER

Charles M. Inman, Flagstaff, and Donald J. Stone, Rimrock, both of Ariz., assignors to W. L. Gore & Assoc., Inc., Newark, Del.

Filed Sep. 14, 1984, Ser. No. 650,722
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—175 **20 Claims**



1. A percutaneous implant device to provide a port of entry into the body comprising:

a nonporous, bicompatible conduit having an upper inlet opening and a lower attached flange, the flange having a top with a continuously curved perimeter and a continuously curved side wall which tapers to a bottom wall having a continuously curved perimeter of larger diameter than said top, and having a central opening therethrough extending from said top through said flange to said bottom wall,

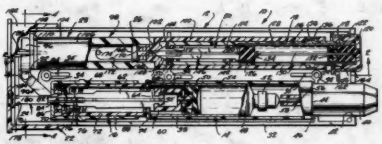
said conduit extending from the top of the attached flange and having an angle bend above said flange which, in use, extends at an angle to the skin, from the bend location to the conduit inlet, wherein said conduit extends from the top of said flange, first necking inwardly and then flaring outwardly, forming an hourglass configuration and having said angle bend just above said hourglass configuration, and wherein said conduit, within a part of said hourglass portion, has an inside diameter which is larger than the inside diameter of the remainder of said conduit providing a decreased conduit wall thickness at said hourglass configuration.

4,578,064

PLURAL DOSAGE AUTOMATIC INJECTOR WITH IMPROVED SAFETY

Stanley J. Sarnoff; George B. Calkins, and William R. Tarello, all of Bethesda, Md., assignors to Survival Technology Inc., Bethesda, Md.

Filed Dec. 21, 1983, Ser. No. 563,768
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—191 **16 Claims**



1. In a plural hypodermic needle and plural spring actuated injecting device of the type comprising outer housing means adapted to be exteriorly manually engaged by a user, a first cylindrical liquid container within said outer housing means, a first hypodermic needle disposed within said outer housing means in a storage position in operative association with said first container, first plunger means operatively associated with said first container, first spring means operatively associated with said first plunger means within said outer housing means, first releasable means normally retaining said first spring means in a stressed condition within said outer housing means, operable upon actuation in response to a predetermined manual actuating procedure to effect release of the stressed condition of said first spring means so that the spring force resulting from said release acts upon said first plunger means to move (1) said first hypodermic needle from said storage position to an extended position into the user and (2) liquid within said first container outwardly through said first hypodermic needle into the user; a second cylindrical liquid container, a second hypodermic needle operatively associated with said second liquid container, second plunger means operatively associated with said second liquid container, second spring means operatively associated with said second plunger means, second releasable means normally retaining said second spring means in a stressed condition operable upon actuation to effect release of the stressed condition of said second spring means, manually operable safety means including first safety means operable (1) when in a safety position with respect to said first releasable means to prevent actuation thereof as aforesaid and (2) when removed from said safety position in relation to said first releasable means to permit the actuation of said first releasable means as aforesaid, the improvement which comprises

automatic safety means operable (1) when in a safety position with respect to said second releasable means to prevent actuation thereof as aforesaid and (2) when removed

from said safety position in relation to said second releasable means to permit the actuation of said second releasable means as aforesaid, and

mechanical motion transmitting means operable to transmit a movement occurring as a result of the actuation of said first releasable means into a secondary actuating movement operable to (1) effect a relative movement between said automatic safety means and said second releasable means sufficient to remove said automatic safety means from said safety position and (2) thereafter actuate said second releasable means to insure that the spring force resulting from the release of said second spring means by said second releasable means acts upon said second plunger means to move (a) said second hypodermic needle longitudinally outwardly into an extended position into the user in generally side-by-side relation to said first hypodermic needle and (b) liquid within said second container outwardly through said second hypodermic needle into said user.

4,578,065

PROTECTIVE SEALING COMPOSITION IN MOLDED FORM

Wagdi W. Habib, Roselle, Ill., assignor to Hollister Incorporated, Libertyville, Ill.

Continuation-in-part of Ser. No. 272,191, Jun. 10, 1981, Pat. No. 4,534,767, which is a continuation-in-part of Ser. No. 185,003, Sep. 8, 1980, abandoned, which is a continuation-in-part of Ser. No. 90,855, Nov. 2, 1979, abandoned. This application Apr. 19, 1985, Ser. No. 725,318

Int. Cl.[4] A61F *5/44*

U.S. Cl. 604—336 **8 Claims**

1. A protective sealing composition in the form of a molded gelled ring, sheet, or the like, said composition comprising essentially a gelled mixture of gelable, water-absorbing, particulate hydrocolloid gum and a non-toxic liquid polyhydroxy alcohol, wherein the improvement comprises having dispersed in said composition an amount of colloidal silica gel within the range from 0.1 to 4.0% by weight, said amount of colloidal silica gel being effective to increase appreciably the mechanical endurance of said sealing composition when exposed to urine.

4,578,066

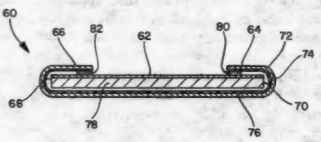
INCONTINENT GARMENT, CATAMENIAL DEVICE OR WOUND DRESSING

James J. O'Connor, Calumet County, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed May 29, 1984, Ser. No. 614,583

Int. Cl.[4] A61F *13/16*

U.S. Cl. 604—366 **13 Claims**



1. A rectangular absorbent pad comprising an impervious outer layer comprising a polymer sheet integrally adhered to a fabric and oriented such that fabric is on the exterior of said pad, an inner absorbent member, and a pervious body-side liner adhered to the body side of said absorbent member wherein said impervious outer layer overlaps the long edges of said absorbent member and is adhered to said pervious liner on the body side of said pad.

4,578,067

HEMOSTATIC-ADHESIVE, COLLAGEN DRESSING FOR SEVERED BIOLOGICAL SURFACES

Mamerto M. Cruz, Jr., Pennington, N.J., assignor to Alcon (Puerto Rico) Inc., Humacao, Puerto Rico

Continuation of Ser. No. 367,455, Apr. 12, 1982, abandoned. This application Mar. 4, 1985, Ser. No. 708,008

Int. Cl.[4] A61L *15/00*; A61F *13/16*

U.S. Cl. 604—368 **19 Claims**

1. A hemostatic-adhesive, collagen dressing for severed biological surfaces, comprising a dry-laid, non-woven, self-supporting web formed from a mass of hemostatic-adhesive, collagen fibers having a moisture content of from about 7% to about 15% by weight, said collagen fibers consisting essentially of an ionizable, water insoluble, partial acid salt of collagen containing from about 50% to about 90% of the theoretical stoichiometric amount of ionizable acid, said web having been calendered to improve its integrity.

4,578,068

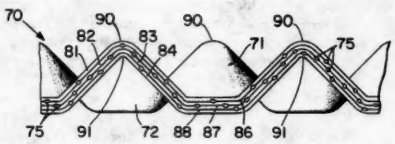
ABSORBENT LAMINATE STRUCTURE

Timothy A. Kramer, Cincinnati; Gerald A. Young, Springfield Township, Hamilton County, and Ronald W. Kock, Wyoming, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 20, 1983, Ser. No. 563,339

Int. Cl.[4] A61F *13/16*

U.S. Cl. 604—368 **32 Claims**



1. A layered absorbent structure of substantially uniform overall density, said structure having an upper surface and a lower surface, said structure comprising:

(a) n webs of fibrous materials, n being an integer of two or more, said webs being layered such that there is an uppermost web, a lowermost web, n−2 intermediate webs, and n−1 interfaces of two opposed adjacent contacting surfaces of adjacent webs, each of said interfaces having a surface area; and

(b) discretely spaced absorbent particles forming a discontinuous layer at one or more of said interfaces;

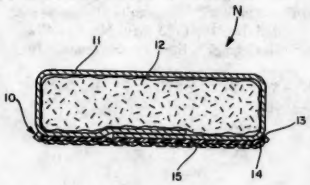
said opposed adjacent contacting surfaces, at each said interface where said particles are present, being substantially entirely frangibly bonded to one another by fiber entanglement at substantially all points of contact between said contacting surfaces without creating discrete areas of densification in said webs of fibrous materials, said frangible bonding of said opposed adjacent contacting surfaces by fiber entanglement being strong enough to keep said discretely spaced particles immobilized at said interface(s) while said layered absorbent structure remains dry, yet weak enough to separate and allow substantially unconstrained expansion of said absorbent particles when said layered absorbent structure is wetted by an aqueous fluid.

4,578,069

BREATHABLE BAFFLE COMPOSITE

Howard A. Whitehead, Outagamie County, Wis., and Ralph V. Braun, Fulton County, Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Aug. 10, 1984, Ser. No. 639,467
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—370 6 Claims



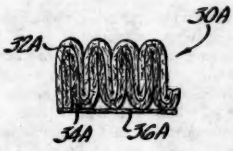
1. In a sanitary napkin with a top surface and a bottom surface comprising a fluid pervious cover on a top surface an absorbent positioned beneath said cover and an essentially moisture impermeable baffle forming a bottom surface of said napkin, and pressure sensitive garment attachment adhesive attached to the bottom surface the improvement characterized by said baffle being formed by a multi-layer composite of a spunbonded polymeric web of at least 8 grams per square meter and a meltblown polymeric web between 13.0 and 28.0 grams per square meter with said adhesive attached to said spunbonded web.

4,578,070

ABSORBENT STRUCTURE CONTAINING CORRUGATED WEB LAYERS

Dennis C. Holtman, Flemington, N.J., assignor to Personal Products Company, Milltown, N.J.

Filed Aug. 15, 1983, Ser. No. 523,473
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—378 17 Claims



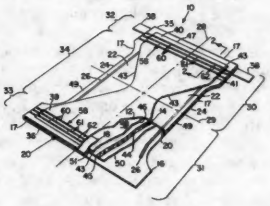
1. An absorbent product comprising a first fibrous layer of synthetic resilient fibers in the form of a nonwoven web and a second layer substantially united to said first layer, said second layer having a higher capillary pressure than said first layer to provide preferential attraction and wicking of liquid in said second layer, said layers being corrugated to provide a corrugated structure, said corrugated structure being stabilized to retain its corrugations when wet.

4,578,071

DISPOSABLE ABSORBENT ARTICLE HAVING AN IMPROVED LIQUID MIGRATION RESISTANT PERIMETER CONSTRUCTION

Kenneth B. Buell, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 463,182, Feb. 2, 1983, abandoned, which is a continuation-in-part of Ser. No. 237,785, Feb. 24, 1981, abandoned. This application Jan. 7, 1985, Ser. No. 689,279
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—379 10 Claims



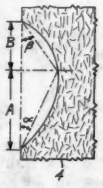
1. A disposable diaper comprising:
a fibrous liquid permeable topsheet;
a liquid impermeable backsheet;
an attachment means for affixing said topsheet to said backsheet;
an absorbent core means for absorbing liquids, said absorbent core means being encased between said topsheet and said backsheet and having a core edge, said absorbent core means having a barriered core edge segment comprising at least a segment of said core edge;
a liquid impermeable barrier member having an outward portion extending from said barriered core edge segment and having an inward portion interposed between said topsheet and said absorbent core means, said topsheet having a liquid migration resistant segment comprising a compacted portion affixed to said inward portion of said barrier member, said compacted portion comprising a multiplicity of continuous bands.

4,578,072

LEAK RESISTANT DIAPER OR INCONTINENT GARMENT

Eugene P. Lancaster, Gig Harbor, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Dec. 8, 1983, Ser. No. 559,597
Int. Cl.[4] A41B *13/02*
U.S. Cl. 604—385 A 12 Claims



1. In a disposable diaper of incontinent brief having an essentially coextensive thin moisture impervious thermoplastic backsheet, a moisture absorbent cellulose pad, and a moisture previous skin contacting nonwoven topsheet, the diaper being of generally rectangular configuration having longitudinal side portions and transverse front and back end portions, the improvement which comprises:

a. front and rear flap means formed by extensions of the backsheet and topsheet beyond the absorbent pad, the front flap being longer than the rear flap and the combined lengths of the flaps being from 15–25% of the total length of the diaper;

b. two attachment straps means permanently bonded at their proximal ends to each rear flap means, each strap having an adhesive distal end for securing the diaper to a wearer and an adhesive free zone between the proximal and distal ends;

c. elastic means located adjacent to and parallel to each longitudinal edge, each elastic means running essentially the full length of the diaper and serving to hold the edges of the brief in close leak-resisting contact with the body of the wearer;

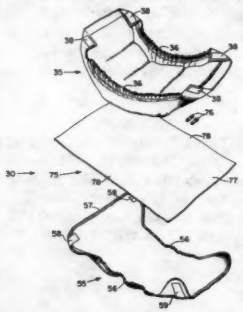
d. the moisture absorbent pad having a crotch area cutout portion along each longitudinal side to give it a generally hourglass-shaped configuration, the longitudinal centers of the cutout portions being located forward of the front-to-back transverse centerline of the pad so that when in use by a wearer the back edge of the diaper is located near the waistline and is higher on the body than the front edge, the crotch area cutout being formed so that the acute angle between a chord drawn from the front of the cutout to the deepest portion and a projection of the side of the diaper is smaller than the acute angle between the chord drawn from the rear of the cutout to the deepest portion and the side projection.

4,578,073

COMPOSITE WASTE-CONTAINMENT GARMENT HAVING DISPOSABLE ELASTICIZED INSERT

John K. Dysart, and Frederick M. Joffe, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 27, 1983, Ser. No. 508,444
Int. Cl.⁴ A61F *13/16*
U.S. Cl. 604—397 **11 Claims**



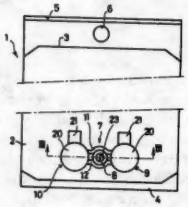
1. A composite waste-containment garment comprising an over-garment having elasticized leg cuffs and liquid impervious construction, an insert having elasticized leg cuffs and a liquid impervious backsheet, and means integral with said insert for securing said insert inside said over-garment so that said leg cuffs of said insert are sealingly tensioned in juxtaposition with skin areas of the wearer when said over-garment having a said insert secured therewithin is applied to an intended wearer, said composite waste-containment garment further comprising an outer-garment which comprises elasticized leg cuffs and liquid impervious construction, said outer-garment further comprising side-closure means which are so disposed and configured to sealingly tension said leg cuffs of said outer-garment in addition to sealingly tensioning said leg cuffs of said insert upon applying said composite garment to a wearer and securing said side-closure means, said outer-garment being sized and configured relative to said insert and said over-garment that said composite garment can be applied to a wearer so that the leg cuffs of said insert are disposed inboard of the longitudinal side edges of said over-garment, and so that the leg cuffs of said outer-garment are disposed outboard of the longitudinal side edges of said over-garment.

4,578,074

INFUSION LIQUID POUCH

Hans M. L. van Leerdam, Berkhout, Netherlands, assignor to Medistad Holland V.V., Medemblik, Netherlands

Filed Jul. 18, 1983, Ser. No. 514,472
Claims priority, application Netherlands, Jul. 22, 1982, 8202952
Int. Cl.⁴ A61B *19/00;* **B65B** *7/02;* **B65D** *33/16, 33/36*
U.S. Cl. 604—408 **9 Claims**



1. An infusion liquid pouch comprising:

a tubular pouch closed at both ends and having a planar side wall;

a unitary structure including a pair of hollow necks and a filling tube connector supported by a common flange, said flange having a flange surface attached to said planar pouch wall, at least one of said necks having an enlarged bore portion extending from the flange surface and terminating in a transverse shoulder which is substantially parallel to said flange surface; and

a pierceable pad enclosed in said enlarged bore and held against said shoulder only by said planar pouch wall;

said necks and said filling tube connector extending at an angle substantially less than 90 degrees to said flange surface, and said transverse shoulder being substantially parallel to said flange surface such that said pierceable pad is held flat against said planar pouch wall.

4,578,075

DELIVERY SYSTEM HOUSING A PLURALITY OF DELIVERY DEVICES

John Urquhart, Palo Alto, and Felix Theeuwes, Los Altos, both of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Filed Dec. 20, 1982, Ser. No. 451,329
Int. Cl.⁴ A61M *7/00*
U.S. Cl. 604—892 **2 Claims**

1. A delivery system for delivering a beneficial agent formulation, the delivery system comprising:

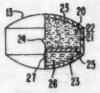
(a) a wall that surrounds and forms an internal space, the wall comprising an inner lamina comprising a pH sensitive material that loses its physical and chemical integrity at a pH of 1.0 to 8.0 inclusive, and an outer lamina comprising a pH sensitive material that maintains its physical and chemical integrity at a pH of 1.0 and 3.5 inclusive, and loses its physical and chemical integrity at a pH of 3.5 to 8.0;

(b) a plurality of tiny osmotic delivery devices useful for delivering a beneficial agent formulation and for co-delivering beneficial agent formulation combinations having a different biological half-life and therapeutic index in the space, the osmotic delivery devices comprising:

(1) a semipermeable wall that surrounds and forms an internal compartment in the osmotic delivery device,

the wall comprising a material that is permeable to the passage of an external fluid and substantially impermeable to the passage of a beneficial agent formulation;

(2) a beneficial agent formulation in the compartment of each tiny osmotic delivery device that is soluble in fluid imbibed into the compartment and exhibits an osmotic pressure gradient across the semipermeable wall of the osmotic delivery device against an external fluid; and,



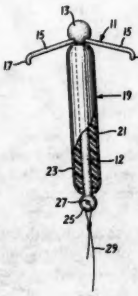
(3) an osmotic passageway in the semipermeable wall of each tiny osmotic delivery device that communicates with the compartment containing the beneficial agent formulation and the exterior of the osmotic device for delivering the beneficial agent formulation through the passageway from the tiny osmotic device over time.

4,578,076

MEDICATED INTRACERVICAL AND INTRAUTERINE DEVICES

Tapani Luukkainen, Helsinki, and Ahti M. K. Liukkonen, Naantali, both of Finland, assignors to The Population Council, Inc., New York, N.Y.

Filed Mar. 20, 1984, Ser. No. 591,610
Int. Cl.[4] A61F *5/46*
U.S. Cl. 604—892 **8 Claims**



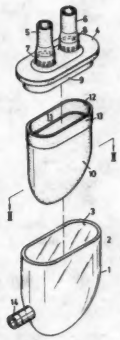
1. A medicated device for retention in the cervix comprising a T-shaped platform, the platform having a vertical stem portion with a drug release attachment thereon, a rounded knob portion at the top thereof and two flat flexible downwardly slanting arms extending from the knob, the arms tapering to a lesser dimension from the knob to the end of the arms, and the ends of the arms having a downward bend of about 45°–110°, said vertical stem being about 18–22 mm in length, and said arms measuring about 5–7 mm from the knob to the downward bend.

4,578,077

BLOOD PUMP APPLICABLE TO AN ARTIFICAL HEART

Yasushi Joh, Yokohama, Japan, assignor to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Nov. 9, 1981, Ser. No. 319,718
Claims priority, application Japan, Nov. 10, 1980, 55-157942
Int. Cl.[4] A61F *1/00*
U.S. Cl. 623—3 **24 Claims**



1. A blood pump comprising:

(a) a housing provided with a port for introducing and discharging fluid;

(b) a cover portion closing the housing tightly;

(c) an inlet conduit portion formed integrally and seamlessly into said cover, said inlet conduit portion including a check valve;

(d) an outlet conduit portion formed integrally and seamlessly into said cover, said outlet conduit portion including a check valve; and

(e) a flexible sac portion defining a blood chamber, said sac portion being oval in cross-section, curved at the bottom, and seamlessly connected to said cover portion, having a maximum width D, a maximum height L and a thickness of that portion below the line described by ½L, which is between 20% and 95% less than the mean thickness of the sac wherein, when the volume of the blood chamber is decreased, the initial contact point between the opposite inner surfaces of the sac is in the area defined by a circle of radius 0.15D the center of which is on the central axis of the wider side of the sac and between 0.2 and 0.45L above the bottom of the sac.

4,578,078

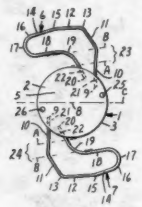
INTRAOCULAR LENS WITH ASYMETRIC VAULTED SUPPORT LOOPS

James J. Arkell, Lake Elmo, and Robert N. Hamlin, Stillwater, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Apr. 2, 1982, Ser. No. 364,396
Int. Cl.[4] A61F *2/16*
U.S. Cl. 623—6 **14 Claims**

1. An intraocular lens comprising a lens body; first and second support members extending from the lens body for engaging adjacent portions of the anterior or posterior chamber of the eye, at least one of said support members comprising a resilient spring-like asymmetric support loop extending outwardly from the periphery of said lens body, said support loop naving first and second end portions attached to the lens body at first and second attachment locations, first and second legs extending from said first and second end portions, respectively, each of said legs containing a sloped portion with the sloped portion of said first leg being nearly equal in length to the sloped portion of said second leg; and a transverse portion

extending generally transversely relative to said first and second legs and with opposite sides being respectively unitarily connected to outer ends of said first and second legs and having at least one outer contact portion dimensioned and shaped to engage adjacent portions of the anterior or posterior chambers of the eye with an outward radial force when positioned



therein so that at least one of said outer contact portions is deflected inwardly from the normal relaxed position by the adjacent portion of the eye to provide support for said lens body, said transverse portion lying in a plane which is spaced apart from but substantially parallel to the plane of said lens body.

4,578,079

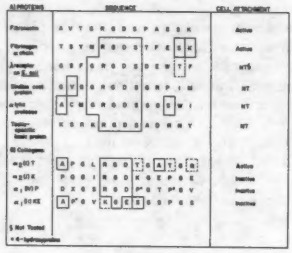
TETRAPEPTIDE

Erkki Ruoslahti, Olivenhain, and Michael Pierschbacher, San Diego, both of Calif., assignors to La Jolla Cancer Research Foundation, La Jolla, Calif.

Continuation-in-part of Ser. No. 405,239, Aug. 4, 1982, Pat. No. 4,517,686, and Ser. No. 433,457, Oct. 8, 1982, and Ser. No. 518,036, Jul. 28, 1983. This application Nov. 22, 1983, Ser. No. 554,821

Int. Cl.[4] A61F *1/00;* **A61K** *37/00;* **C07C** *103/52;* **C07G** *7/00*

U.S. Cl. 623—11 **44 Claims**



1. A composition of matter which promotes the attachment of cells to substrate when immobilized on the substrate and consisting essentially of the peptide X-Arg-Gly-Asp-R-Y wherein X is H or at least one amino acid and Y is OH or at least one amino acid, and R is an amino acid selected from Thr or Cys, characterized in that it has cell-attachment-promoting activity.

4,578,080

JOINT PROSTHESES

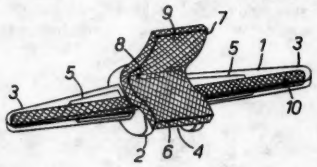
Basil H. Helal, Broomer Cottage, Churchgate, Cheshunt, Hertfordshire, England

Filed Sep. 8, 1983, Ser. No. 530,302

Int. Cl.[4] A61F *1/00*

U.S. Cl. 623—13 **8 Claims**

1. A joint prosthesis, comprising: an elongated body of resilient biocompatible material having an enlarged main part for positioning between two bones of a joint, first and second intermedullary stems projecting from respective opposite points of said main part, tendon retaining means for retaining at least a portion of a tendon, said tendon-retaining means comprises a flap integrally connected to said main part and adapted



to lie thereover defining a continuous channel therebetween for receiving and slidably guiding at least part of the tendon, where the tendon is positionally stabilized relative to said main part and is contiguous with said main part.

4,578,081

BONE PROSTHESIS

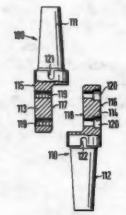
Hans E. Harder, Probsteierhagen; Klaus Behrens, Rickling, both of Fed. Rep. of Germany, and Rainer Kotz, Vienna, Austria, assignors to Howmedica International, Inc., Kiel, Fed. Rep. of Germany

Filed May 24, 1982, Ser. No. 381,607

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1982, 3205577

Int. Cl.[4] A61F *1/04*

U.S. Cl. 623—22 **13 Claims**



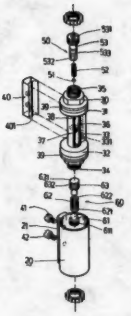
1. A bone prosthesis assembly for replacement of at least part of a natural joint of a patient comprising a connection member adapted to be connected to the bone of the patient at one end of said connection member, a set of joint components, each of said joint components including a cylindrical shank portion of different length adapted to be connected by a mutually engaging frictional self-locking cone-type connection to said connection member at the other end of said connection member, and a set of elongation pieces of varying length each adapted to be arranged between any one of the joint components and the connection member, with said connection member being provided with an outer male conical portion and each of said joint components being provided with an inner female conical portion adapted for reception of and mutual engagement with said outer male conical portion, with each of said elongation pieces comprising a cylindrical body portion provided with an inner female conical portion opening to one end of the body portion, and an outer male conical portion extending from the other end of the body portion, with the outer diameter of each of said elongation piece body portions being equal to the outer diameter of each of said joint component shank portions, and with the shank portion abutting the adjacent body portion when a joint component and elongation piece are connected.

4,578,082

FLUID CUSHIONING APPARATUS ACTING AS A PIVOTING MEDIUM OF TWO OBJECTS HAVING A PIVOTING FEATURE

Chen Sen-Jung, No. 236, Sec. 3, Ho Ping W. Rd., Taipei, Taiwan

Filed Jan. 3, 1984, Ser. No. 567,798
Int. Cl.[4] A61F 2/72, 2/74, 2/62; F16M 1/00
U.S. Cl. 623—26 7 Claims



1. A fluid cushioning apparatus acting as a pivoting medium of two objects having a pivoting feature comprising:

a sleeve adapted to be mounted on a first object; two annulations coaxially mounted in the two ends of said sleeve respectively;

a shaft mounted in the openings of the centers of said two annulations and having a dividing wall being axially and radially extended between said two annulations to closely engage with the interior wall of said sleeve and being adapted to be mounted on a second object which is always to have a pivoting relationship with said first object;

a partitioning piece capable of being fitted among said sleeve, said shaft and said two annulations and secured on said sleeve so that the space formed between said shaft and said sleeve is divided into two compartments; and

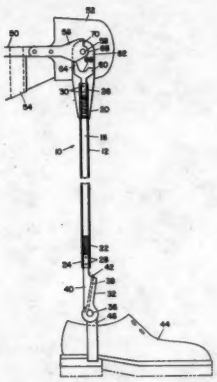
a means controlling the flow of a cushioning fluid contained in said space when said first and second objects are in relative pivoting movement and thus the fluid contained in one of said two compartments will flow through said means to the other one compartment so that said pivoting movement of said first and second objects is cushioned by said controlled fluid flow.

4,578,083

ARTIFICIAL LEG

Allton C. Williams, 5118 Longridge, Sherman Oaks, Calif. 91423

Filed May 16, 1983, Ser. No. 495,149
Int. Cl.[4] A61F 1/02
U.S. Cl. 623—42 4 Claims



1. An artificial leg comprising an elongated lower leg portion comprising a tubular sleeve having therein a rod and springs means fixedly attached to each end of said rod within said sleeve, an ankle joint having one end attached to a shoe and an opposite end attached to a lower end of said rod;

an upper leg portion, means to attach said upper leg portion to the thigh of the wearer;

a knee joint located at an upper end of said rod comprising an upper cam and a lower cam, said upper cam is attached to said upper leg portion and adapted to rotate about a pivot, said upper cam having a convex surface defined by a semi-circle wherein a flat surface extending forward of said surface is substantially perpendicular to the tangent of said circle and a rearwardly extending surface is substantially parallel to the tangent of said circle; and

said lower cam is attached to the said upper portion of said rod and having a concave surface and an elongated rearwardly extending finger and a planar surface extending in a forward direction wherein each of said surfaces of the lower cam compliment said upper cam surfaces so as to lock with said upper cam when pressure is placed on the leg and wherein said springs maintain constant friction between said upper cam and lower cam.

4,578,084

FIBER-TREATING METHOD AND COMPOSITION THEREFOR COMPRISING EPOXY-SILICONE AND ACRYLAMIDE RESIN

Hideo Kakinoki, Hino, and Isao Ona, Sodegaura, both of Japan, assignors to Toray Silicone Co., Ltd., Tokyo, Japan

Filed Sep. 17, 1984, Ser. No. 651,387
Claims priority, application Japan, Oct. 28, 1983, 58-203395
Int. Cl.[4] D06M *1/00*
U.S. Cl. 8—115.61 14 Claims

1. An aqueous composition comprising a fiber-treating agent consisting of

(a) 10 to 99.5 percent by weight, based on the weight of the fiber-treating agent, of an organopolysiloxane having an average of at least two epoxy group-containing, silicon-bonded organic groups per molecule, substantially all other organic groups of the organopolysiloxane being selected from the group consisting of monovalent hydrocarbon groups and halogenated monovalent hydrocarbon groups and

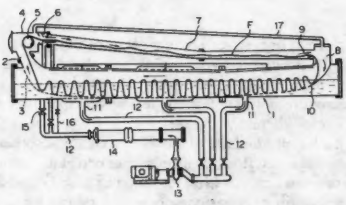
(b) 0.5 to 90 percent by weight, based on the weight of the fiber-treating agent, of a water-soluble polyacrylamide resin.

4,578,085

APPARATUS FOR LIQUID FLOW TREATMENT OF FABRICS

Osamu Ishimaru, Matsubara, Japan, assignor to Hisaka Works, Ltd., Osaka, Japan

Filed Nov. 20, 1984, Ser. No. 673,264
Claims priority, application Japan, Sep. 13, 1984, 59-190612
Int. Cl.[4] D06B *3/28*
U.S. Cl. 8—152 19 Claims



1. Apparatus for wet treatment of a fabric as an endless rope comprising, an elongate fabric reservoir tank for wet-treating fabrics therein as an endless rope, said fabric reservoir tank containing in use treating liquid gradually increasing in depth in a direction in which a fabric endless rope being treated is advanced longitudinally therein, a fabric delivery tube above the level of the treating liquid in said fabric reservior tank, means for lifting the fabric out of the treating liquid in said fabric reservoir tank and for introducing it into said fabric delivery tube for advancement longitudinally by a high-speed stream of treating liquid therein, means comprising a treating liquid jet nozzle for receiving treating liquid from said fabric reservoir tank and developing a jet flow treating liquid as said high-speed stream in the fabric delivery tube for advancing the fabric as an endless rope, the fabric delivery tube having a discharge end portion above the level of the treating liquid in the fabric reservoir tank for discharging the jet flow of treating liquid for return to said fabric reservoir tank and for discharging the accompanying advancing fabric, means for spreading laterally the advancing fabric as it is discharged from the fabric delivery tube comprising a fabric-spreading plate having upper surfaces defining a path of advancement for the advancing fabric over which the fabric travels relative to a path of travel in said discharge end portion of the fabric delivery tube to effectively subject the advancing fabric to lateral flow of the discharged treating liquid of said jet flow relative to said path of advancement from said discharge end portion of said fabric delivery tube to thereby spread the fabric laterally, said fabric-spreading plate terminating so that the spread advancing fabric falls downwardly therefrom accompanied with discharged treating liquid, a curved plate below the fabric-spreading plate on to which the spread fabric falls above the level of the treating liquid in said fabric reservoir tank accompanied by discharged treating liquid, and said curved plate extending into said treating liquid in said fabric reservoir tank for smoothly guiding the spread advancing fabric into said treating liquid in said fabric reservoir tank.

4,578,086

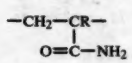
METHOD FOR CONTROLLING BORIC ACID PARTICLE SIZE DISTRIBUTION

Avinash D. Puri, Ridgecrest; James L. Fairchild, Trona, and James B. Rodosevich, Ridgecrest, all of Calif., assignors to Kerr-McGee Chemical Corporation, Oklahoma City, Okla.

Filed Sep. 2, 1983, Ser. No. 528,956
Int. Cl.[4] B01D *9/02*
U.S. Cl. 23—300 7 Claims

1. A method for controlling particle size distribution of boric acid during the crystallization of said acid from a saturated aqueous feed solution thereof comprising adding to said saturated solution prior to commencement of the crystallization of said acid at least one water soluble polymeric material, in an amount ranging from about 20 to about 150 parts per million, selected from the group consisting of:

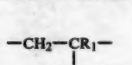
A. homopolymers containing repeating units of the structural formula



(I)

wherein R is selected from the group consisting of hydrogen atom and methyl radical, and

B. copolymers containing from 1% to 99% of repeating units corresponding to structural formula (I) and from about 99% to 1% of repeating units corresponding to the structural formula



(II)

wherein R_1 is selected from the group consisting of hydrogen atom and methyl radical provided, however, that R and R_1 are not the same said homopolymers and copolymers having molecular weights ranging from about 200,000 up to about 5,000,000 and separating said crystallized boric acid by means selected from the group consisting of filtration and centrifugation.

4,578,087

NITRIDE BASED CUTTING TOOL AND METHOD FOR PRODUCING THE SAME

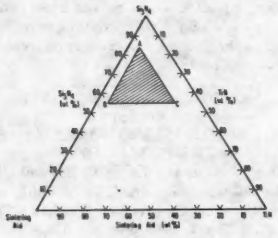
Hiroshi Tanaka, and Hidetoshi Baba, both of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Filed Jan. 10, 1984, Ser. No. 569,683
Claims priority, application Japan, Jan. 10, 1983, 58-1988; Jun. 3, 1983, 58-99901; Jun. 3, 1983, 58-99902
Int. Cl.[4] B24D *3/02*
U.S. Cl. 51—295 4 Claims

1. A nitride based ceramic cutting tool comprising from 50 to 90% by weight Si_3N_4, from 5 to 45% by weight TiN and from 5 to 45% by weight a composite oxide sintering aid, said sintering aid comprising (1) at least one of Y_2O_3 and Dy_2O_3 and (2) Al_2O_3 alone or a mixture of AlN and Al_2O_3, said mixture comprising from 5 to 65% by weight AlN, and the weight ratio of (1) at least one of Y_2O_3 and Dy_2O_3 to (2) Al_2O_3 alone or the AlN and Al_2O_3 mixture being 3:1 to 1:3,

wherein the Si_3N_4, TiN and sintering aid comprise from 50 to 80%, from 10 to 45% and from 5 to 40% by weight,

respectively said sintering aid comprising (1) at least one of Y_2O_3, and Dy_2O_3 and (2) Al_2O_3, the weight ratio of (1)



at least one of Y_2O_3 and Dy_2O_3 to (2) Al_2O_3 being 3:1 to 1:3, further comprising a surface coating layer of Al_2O_3 formed thereon.

4,578,088

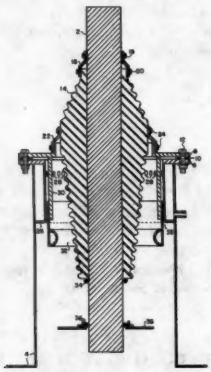
ELECTRICAL INSULATING AND SEALING APPARATUS AND PROCESS FOR USING SAME

Denver D. Linscheid, American Falls, Id., assignor to FMC Corporation, Philadelphia, Pa.

Filed Dec. 17, 1984, Ser. No. 682,624

Int. Cl.[4] B03C *3/00*

U.S. Cl. 55—2 **8 Claims**



1. A process of keeping an electrical insulator seal clean of deposits and particulates, wherein said insulator seal seals a lead-in conductor passing through it and through the wall of an electrical precipitating apparatus comprising passing a pressurized gas into a manifold extending concentrically around the lower portion of said insulator seal, removing the gas through a plurality of holes in the manifold adjacent the insulator seal, allowing the removed gas to impinge on the surface of the insulator seal, passing the impinged gas downwardly through a cylindrical member having a lower lip of decreased internal diameter extending concentrically around the lower portion of said insulator seal, said lip creating a venturi section at the base of said cylindrical member, said gas increasing in velocity as it flows downwardly through the venturi and over the surface of said insulator seal, thereby hindering deposition of particulates and condensables on the surface of said insulator seal.

4,578,089

METHOD OF SEPARATING HIGHLY ADSORBABLE COMPONENTS IN A GAS STREAM IN A PRESSURE-SENSING ADSORBER SYSTEM

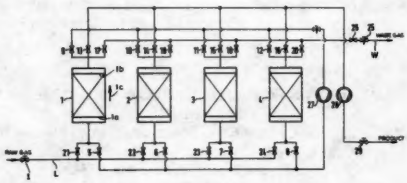
Ekkehard Richter, Essen; Werner Körbacher, Mülheim; Karl Knoblauch, Essen; Klaus Giessler, Gelsenkirchen, and Klaus-Burkhard Harder, Oberhausen, all of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Filed Dec. 14, 1984, Ser. No. 682,036

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1983, 3345379

Int. Cl.[4] B01D *53/04*

U.S. Cl. 55—26 **21 Claims**



1. In a method of recovering, in a pressure swing adsorption process, at least one relatively highly adsorbable product gas component for a raw gas containing said product gas component in admixture with at least one less adsorbable gas component in a cycle wherein:

(a) in an adsorption phase in a pressure swing adsorber, said raw gas is passed through an adsorber bed at an adsorption pressure in a first gas flow direction to adsorb said highly adsorbable product gas component on said bed and past a waste gas containing said less adsorbable component, the adsorption phase of step (a) being terminated before breakthrough of said highly adsorbable product gas component through said bed;

(b) said bed is flushed in a flushing phase with a flushing gas such that at least toward the end of said flushing phase said flushing gas has a concentration of said highly adsorbable product gas component substantially equal to that in a product gas;

(c) the pressure is thereafter reduced in said adsorber in a desorption gas to desorb said highly adsorbable product gas component from said adsorber to produce said product gas containing said highly adsorbable product gas component, said product gas being withdrawn from said adsorber, and a portion of said product gas is fed as a flushing gas for use in a subsequent practice of step (b); and

(d) the pressure in the adsorber desorbed in step (c) is thereafter rebuilt to said adsorption pressure,

the improvement which comprises:

(e) intermittently between the end of said adsorption phase and before the commencement of said desorption phase in the cycle of said adsorber, drawing a partial gas flow from said adsorber in the same direction as the flow of gas therethrough during an immediately prior period of the cycle to reduce the pressure in said adsorber; and

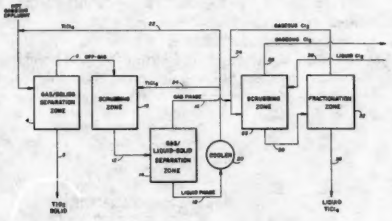
(f) reusing said partial gas flow in said pressure swing adsorption process.

4,578,090

METHOD FOR PROCESSING GASEOUS EFFLUENT STREAMS RECOVERED FROM THE VAPOR PHASE OXIDATION OF METAL HALIDES

Theodore A. Rado, Oklahoma City, Okla., assignor to Kerr-McGee Chemical Corporation, Oklahoma City, Okla.

Filed Oct. 15, 1984, Ser. No. 660,875
Int. Cl.[4] B01D *47/05*
U.S. Cl. 55—48 10 Claims



1. A method for processing a hot gaseous effluent stream recovered from a vapor phase oxidation of a volatile metal halide to produce a particulate metal oxide thereof, said effluent stream containing a residual amount of said particulate metal oxide suspended therein, unreacted volatile metal halide vapors and by-product halogen gas comprising the steps of:

contacting said hot, gaseous effluent stream with a first quantity of a recycle stream of cool, volatile metal halide, said contact causing evaporation of said first quantity of said recycle stream of cool, volatile metal halide to thereby effect a cooling of said hot gaseous effluent stream to provide a lower temperature gaseous effluent stream;

subjecting said lower temperature gaseous effluent stream to separation to effect removal of at least a major portion of the residual amount of said particulate metal oxide suspended therein and provide an off-gas stream containing any remaining minor portion of the residual amount of said particulate oxide, the unreacted volatile metal halide vapors and by-product halogen gas;

contacting the off-gas stream with a second quantity of said recycle stream of cool, volatile metal halide to effect a further cooling of said off-gas stream and thereby form a mixture, said mixture comprising a liquid phase and a gas phase, wherein said liquid phase contains said second quantity of the recycle stream of cool, volatile metal halide, a major portion of condensed volatile mtal halide vapors and any remaining minor portion of the residual amount of particulate metal oxide and wherein said gaseous phase contains any remaining minor portion of the volatile metal halide vapors and by-product halogen gas;

separating the liquid phase and gaseous phase from said mixture thereof, wherein said liquid phase is cooled and comprises the recycle stream of cool, volatile metal halide for contacting with said hot gaseous effluent stream and said off-gas stream;

contacting said gaseous phase with a stream of cold liquid halogen to absorb the remaining minor portion of volatile metal halide vapors therein and to provide a gaseous phase of by-product halogen gas; and

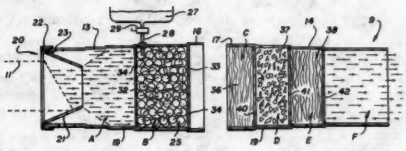
recovering from said stream of cold liquid halogen the remaining minor portion of the volatile metal halide vapors absorbed therein as a separate volatile metal halide liquid phase.

4,578,091

MULTI-CHAMBERED AIR CLEANER

Antonio B. Borja, 1925 S. Corona, Denver, Colo. 80210

Filed Apr. 20, 1984, Ser. No. 602,598
Int. Cl.[4] B01D *47/14*
U.S. Cl. 55—90 15 Claims



1. A process for removing impurities from hot exhaust air, said process comprising:

providing treating chamber means having heat absorbing solid discrete particle material therein extending across the path of the treating chamber means;

introducing water into said treating chamber means into contact with said discrete particle material;

passing hot exhaust air through said treating chamber means with said hot exhaust air contacting said heatable solid material to slow the flow of said hot exhaust air and to heat the same to vaporize water in said treating chamber means to thereby coagulate particles of matter to be removed from said hot exhaust air; and

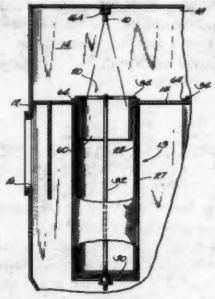
passing said treated air with said coagulated particles of matter therein through at least one filter to remove said coagulated particles of matter from said air.

4,578,092

METHOD AND APPARATUS FOR IMPROVING THE OPERATION OF A DUST COLLECTOR

William J. Klimczak, Racine, Wis., assignor to Wehr Corporation, Milwaukee, Wis.

Filed Nov. 4, 1983, Ser. No. 548,911
Int. Cl.[4] B01D *46/04*
U.S. Cl. 55—302 5 Claims



1. A dust collector comprising, in combination,

a hopper,

an exhaust chamber,

a wall separating said hopper and said exhaust chamber, said wall including an opening having a diameter,

means for filtering contaminated air flowing through said opening from said hopper, said filtering means including a hollow fitler assembly comprising filter medium and having upper and lower ends, said upper end of said filter assembly registering with said wall opening, said hopper being generally sealed from said exhaust chamber except through said wall opening and said filter medium of said

filter assembly, and said filtering means further including means for supporting said filter assembly and for sealing said lower end of said filter assembly, said supporting and sealing means copmrising an end plate generally parallel to said wall and at said lower end of said filter assembly,

means defining an inlet into said hopper for introducing contaminated air into said hopper so that said contaminated air is caused to flow to said exhaust chamber through said filter medium and airborne contaminants are accumulated on said filter medium,

means for selectively directing reverse pulses of air into said wall opening from said exhaust chamber whereby said reverse air pulses enter said filter assembly and generate airflow through said filter medium in the reverse of the direction of contaminated airflow to remove accumulated contaminants from said filter medium, said air pulse directing means including nozzle means spaced above said wall opening, said nozzle means being constructred to accelerate the air emitted toward said wall opening such that said air pulses are emitted from said nozzle means and propagate toward said wall opening in a cone-shaped pattern and enter said wall opening, and

means for reducing the velocity of said reverse air pulses and for preventing said reverse air pulses from impinging upon said filter medium as said reverse air pulses propagate to said lower end of said hollow filter assembly, said reducing and preventing means including an air impermeable sleeve having upper and lower ends, an outer surface and an inner cylindrical surface, and an outside diameter substantially equal to said diameter of said wall opening, said sleeve being positioned inside said hollow filter assembly with said outer surface closely adjacent but spaced from said filter medium, and with said upper end of said sleeve registering with said wall opening and said lower end of said sleeve opening into said filter assembly, said sleeve extending into said filter assembly a substantial distance and with the lower end thereof being spaced from said nozzle means a preselected distance to insure that air pulse cone-shaped pattern impinges on said inner surface of said sleeve, said preselected distance also being such that the velocity of said air pulses emitted from said lower end of said sleeve is reduced sufficiently as compared to the velocity of said air pulses at said opening so that said air pulses emitted from said lower end of said sleeve do not grow by drawing air through said filter medium so as to impinge upon said filter medium as said air pulses propagate from said lower end of said sleeve to said lower end of said hollow filter assembly but impinge directly on said end plate.

4,578,093

WET AND DRY DISTILLATIVE FREEZING PROCESS FOR SEPARATING MIXTURES AND APPARATUSES FOR USE THEREIN

Chen-Yen Cheng, and Sing-Wang Cheng, both of 9605 La Playa St., NE., Albuquerque, N. Mex. 87111

Continuation-in-part of Ser. No. 480,932, Mar. 31, 1983, Pat. No. 4,451,273, which is a continuation of Ser. No. 296,130, Aug. 25, 1981, Pat. No. 4,378,984, which is a continuation-in-part of Ser. No. 181,002, Aug. 22, 1980, abandoned, Ser. No. 930,312, Aug. 2, 1978, Pat. No. 4,218,893, Ser. No. 816,852, Jul. 18, 1977, abandoned, and Ser. No. 676,640, Apr. 13, 1976, abandoned. This application May 24, 1984, Ser. No. 613,573

Int. Cl.[4] B01D *9/04*; F25J *3/00*

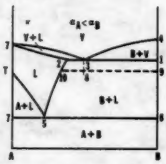
U.S. Cl. 62—12 **19 Claims**

1. A wet and dry distillative freezing process for separating a feed mixture that contains a volatile crystallizing component, denoted as B-component, and one or more non-crystallizing components into a refined B-product and a B-lean product through formation of a mass of B-enriched solid that comprises the following steps:

(1) a first step of forming a condensed mass, denoted as the first step condensed mass, and K_{-1} mixture, which contains a mass of B-enriched solid phase by removing heat from at least a major part of the feed mixture.

(2) a second step of bringing a mass of liquid in contact with the first step condensed mass to thereby form a solid-liquid mixture, denoted as the second step condensed mass and K_0 mixture, which has a solid phase mass, S_0, enriched in B-component, and a mother liquor phase mass M_0 that contains the B-component and one or more volatile and non-crystallizing components, the volatile and non-crystallizing component present in the greatest amount in the K_0 mixture, denoted as A-component, and the B-component forming a pair of two key volatile components, wherein the two key volatile components form a binary system

(a) whose characteristic vapor pressure ratio defined as the ratio of the vapor pressure of A-component to that of B-component both evaluated at the triple point temperature of B-component is in the range of 0.1 to 10 and



is less than the ratio of the heat of sublimation to the heat of melting of B-component evaluated at the triple point temperature of B-component, and

(b) whose constant pressure phase diagram that includes a three phase (B-enriched solid, liquid and vapor) state has a two phase (B-enriched solid and vapor) region covering a substantial concentration range above the temperature of the three phase state and a two phase (B-enriched solid and liquid) region below the temperature of the three phase state, and

(3) a third step of subjecting the K_0 mixture to a dry distillative freezing operation by concurrently vaporizing the volatile components from the mixture in a first zone under a first temperature and first pressure that are respectively lower than the triple point temperature and the triple point pressure of the pure B-component to form a vapor mixture, denoted as the third step vapor, and a condensed mass, denoted as the third step condensed mass, which becomes the refined B-product.

4,578,094

HYDROCARBON SEPARATION WITH A PHYSICAL SOLVENT

Yuv R. Mehra, P.O. Box 3986, Odessa, Tex. 79760

Continuation-in-part of Ser. No. 532,005, Sep. 13, 1983, which is a continuation-in-part of Ser. No. 507,564, Jun. 24, 1983, which is a continuation-in-part of Ser. No. 374,270, May 3, 1982, Pat. No. 4,421,535. This application Aug. 3, 1984, Ser. No. 637,210

Int. Cl.[4] F25J *3/02*

U.S. Cl. 62—17 **22 Claims**

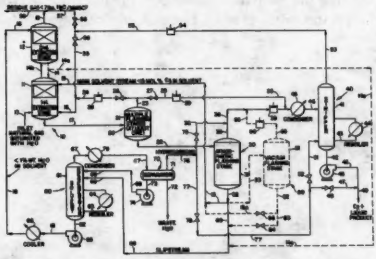
1. In a continuous process for producing a liquid hydrocarbon product of a selected composition, which is selectively adjustable to substantially any selected degree in accordance with market conditions, and a residue natural gas stream of pipeline quality that selectively includes ethane (C_2), propane (C_3), and butanes (C_4) by extraction of an inlet natural gas stream, containing at least 0.2 mol percent of C_5+ hydrocarbons, with a stream of a physical solvent, an improvement which comprises:

minimizing the energy required for said process while recovering up to 100% of said C_5+ hydrocarbons in accordance with said market conditions by the following steps:

A. selectively extracting said inlet natural gas stream in a

first extraction stage with a major solvent stream and in a second extraction stage with a minor solvent stream, said major solvent stream containing up to an equilibrium amount of C_5+ hydrocarbons and said minor solvent stream being lean with respect to C_1+ hydrocarbons, whereby a rich solvent stream and a residue natural gas stream are produced, said residue natural gas stream containing selected maximum amounts of C_2+ hydrocarbons in accordance with said market conditions;

B. successively flashing said rich solvent stream in a plurality of flashing stages at pressures that successively decrease to about atmospheric pressure in order to produce



a plurality of successive C_1+ gas fractions, having successively lower methane contents, and flashed solvent streams containing said solvent and hydrocarbons having successively lower methane contents, the flashing pressures of said successive flashing stages being selectively varied in order to adjust the compositions of said successive gas fractions and of said successive flashed solvent streams;

C. dividing said physical solvent stream into said major solvent stream and a slipstream; and

D. regenerating said slipstream in order to produce said minor solvent stream for said second extraction stage.

4,578,095

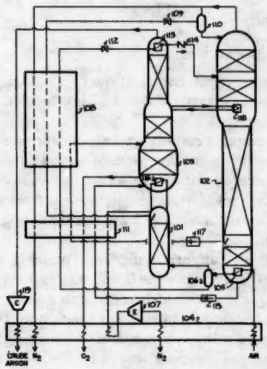
LOW ENERGY HIGH PURITY OXYGEN PLUS ARGON

Donald C. Erickson, 1704 S. Harbor La., Annapolis, Md. 21401

Filed Aug. 20, 1984, Ser. No. 642,103

Int. Cl.[4] F25J *3/04*

U.S. Cl. 62—22 **20 Claims**



1. In a distillative apparatus for producing high purity oxygen comprising a triple pressure distillation arrangement comprised of a high pressure (HP) rectifier, a medium pressure (MP) nitrogen rejection column, and a low pressure (LP) oxygen-argon separation column, wherein both the LP and MP columns have oxygen-argon stripping sections, and wherein the LP column feed is from a means for withdrawing MP column liquid sidestream from above the argon stripping section of the MP column, the improvement comprising:

an intermediate reflux condenser in the LP column, which exchanges latent heat with a boiling liquid;

means for introducing said boiling liquid into an intermediate height of the MP column;

a means for withdrawing crude argon fluid from the LP column overhead and removing it from the triple pressure distillation apparatus means for evaporating bottom liquid of said MP and LP columns of O_2 product of at least 98% purity.

13. A process for obtaining high purity oxygen and crude argon from air comprising

(a) compressing, cleaning, and cooling the air to near its dewpoint

(b) partially condensing the air in a reboiler of a nitrogen rejection distillation column (MP column);

passing the remaining uncondensed air to a high pressure (HP) rectifier;

(d) rectifying said remaining air to at least a liquid N_2 overhead product and an oxygen enriched liquid (kettle liquid) bottom product;

(e) passing said kettle liquid to said MP column as feed therefor by at least one of the steps of

(I) feeding it directly to the column after expansion to column pressure;

(II) at least partially evaporating it by latent heat exchange with vaporous reflux fluid from the LP column described in step (f) prior to passing it to said MP column;

(f) withdrawing a sidestream of liquid oxygen containing argon impurity from near the bottom of the MP column and passing it to an argon-oxygen distillation column (LP column) as feed therefor;

(g) distilling said sidestream to high purity oxygen bottom product and crude argon overhead product

(h) withdrawing said crude argon;

(i) refluxing said LP column at at least two vertically spaced locations by latent heat exchange with at least two evaporating liquids, which are obtained from at least one of the following sources:

(I) a midlength location of the MP column,

(II) the kettle liquid as per step (e) (II);

(j) introducing said at least partially evaporated liquids from step (i) into said MP column at vertically spaced locations;

(k) evaporating the bottom product from said MP and LP columns, and withdrawing the resulting gaseous oxygen of at least 98% purity.

4,578,096

GRADIENT INDEX OPTICAL COMPONENTS

Walter P. Siegmund, Woodstock, Conn., assignor to Warner-Lambert Technologies, Inc., Tex.

Filed Aug. 13, 1980, Ser. No. 177,549

Int. Cl.[4] G02B *6/18*

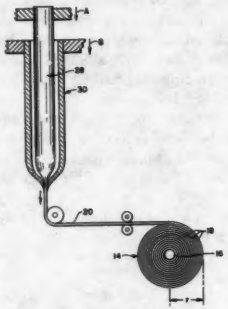
U.S. Cl. 65—3.11 **10 Claims**

1. The method of making a gradient refractive index optical component comprising the steps of:

drawing a thin and flexible glass fiber having a longitudinally variable index of refraction;

winding said fiber over a glass core member in multiple layer fashion;

fusing said wound fiber and core member together as a solid mass;



drawing the mass to the reduced cross-sectional size desired of said optical component; and

transaxially cutting said component from the draw.

4,578,097

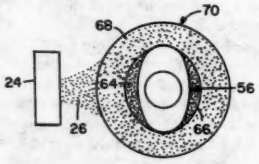
METHOD OF FORMING A POLARIZATION PRESERVING OPTICAL WAVEGUIDE

George E. Berkey, Pine City, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Sep. 26, 1983, Ser. No. 535,466

Int. Cl.[4] C03B *25/02*

U.S. Cl. 65—3.11 12 Claims



10. In a method of forming a single-mode optical fiber having polarization-retaining characteristics comprising the steps of

depositing on a substantially cylindrical mandrel a coating of core glass particles,

depositing on the surface of said core glass particles a coating of inner cladding glass particles,

removing said mandrel to form a hollow porous preform having a circular outer surface,

heating said porous preform to a temperature within the consolidation temperature range to form a consolidated dense glass preform having an aperture therethrough,

closing both ends of said aperture,

removing diametrically opposed regions of said inner cladding glass to form a preform foreproduct having two rounded sides and two flattened sides,

grinding the flattened surfaces formed by removing said diametrically opposed regions to smooth the surface of said foreproduct and to round any sharp corners thereon to form a preform foreproduct having an oblong cross-section,

depositing on said oblong foreproduct a layer of glass particles having the same composition as said inner cladding glass and then,

depositing on the surface of the resultant article a layer of glass particles having a thermal coefficient of expansion which differs from that of the inner cladding layer by at least 1×10^{-7}/C.° which forms a circular outer stress cladding,

heating the resultant article to consolidate said layer of glass particles, thereby forming a solid glass draw blank, and

drawing said solid glass draw blank to form a single-mode optical fiber comprising a circular core, on oblong layer of inner cladding glass and a circular outer stress cladding, said inner cladding layer having a high aspect ratio and a thin minimum thickness on opposite sides of said core whereby said optical fiber exhibits stress-induced birefringence sufficient to form polarization, wherein the step of depositing on said oblong foreproduct substantially preventing the formation of seeds at the interface between the inner and outer cladding of said optical fiber.

4,578,098

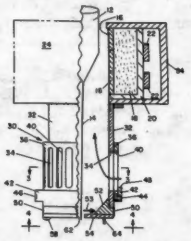
APPARATUS FOR CONTROLLING LIGHTGUIDE FIBER TENSION DURING DRAWING

Un C. Paek, Lawrenceville, and Charles M. Schroeder, Wrightstown, both of N.J., assignors to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Jun. 15, 1984, Ser. No. 621,291

Int. Cl.[4] C03B *23/04*

U.S. Cl. 65—13 1 Claim



1. Apparatus for regulating the flow of a cooling gas into a lightguide furnace to control the drawing tension of a lightguide comprising:

means for directing a cooling gas into the furnace so that the cooling gas flows at least partially around the lightguide fiber and generally upwardly along the walls of the lightguide furnace away from the lightguide fiber to cool the fiber, said means having at least one cooling gas opening therein; and

a sleeve coaxially aligned with, and rotatable about, said cooling gas directing means, said sleeve having at least one cooling gas opening therethrough in communication with, but substantially misaligned relative to, said cooling gas directing means opening so that cooling gas entering said cooling gas directing means is directed substantially tangentially to the inner surface of said cooling gas directing means to cool the lightguide fiber, the amount of cooling being controlled by rotating said sleeve relative to said cooling gas directing means to vary the degree of misalignment of each said sleeve opening relative to each said cooling gas directing means opening.

4,578,099
APPLYING A LIQUID TO A GLASSWARE-MAKING PREFORM MOLD

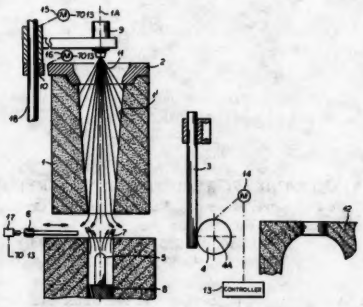
Jochen Hübner, Bottrop-Welheim; Werner-Dieter Knoth, and Helmut Hüllen, both of Essen, all of Fed. Rep. of Germany, assignors to Veba-Glas AG, Essen, Fed. Rep. of Germany

Filed Apr. 13, 1984, Ser. No. 600,188

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1983, 3313851

Int. Cl.⁴ C03B *40/02*

U.S. Cl. 65—26 **6 Claims**



1. An apparatus for making hollow glassware, the apparatus comprising:

a preform mold having an upright throughgoing passage with an upper end and a lower end;

a bottom molding unit below the preform mold displaceable between an upper position engaged in the lower passage end and a lower position spaced below the preform mold;

a final mold adjacent the preform mold;

a neck-forming mold displaceable between one end position blocking the lower end of the passage and another end position at a final mold;

means including nozzles displaceable into a position above the upper passage end for spraying a liquid into the upper end of the passage of the preform mold; and

drive means for retaining the neck-forming mold temporarily in an intermediate position between the two molds and simultaneously spraying the liquid into the passage, whereby the sprayed liquid can pass freely through the passage since its one end is not blocked by the shear; and

means for shielding the bottom molding unit below the one end of the passage and in the lower position of the unit during spraying of the liquid into the upper passage end.

4. A method of making glassware using a multipart preform mold closable to form an upright mold passage having upper and lower ends, a final mold adjacent the preform mold, and a neck-forming mold displaceable between the preform and final molds, the method comprising the steps of:

(a) spraying a mold-release liquid through the upper end into the passage of the closed preform mold while holding the neck-forming mold in an intermediate position spaced from the lower passage end and between the preform and final molds and while shielding a bottom-blowing unit below the lower end of the passage;

(b) thereafter displacing the neck-forming mold from the intermediate position into a position covering the lower passage end;

(c) thereafter introducing a gob of molten glass through the upper end into the passage whose lower end is closed by the neck-forming mold;

(d) thererafter blowing the gob into a preform;

(e) thereafter opening the preform mold;

(f) thereafter moving the neck-forming mold and the gob carried thereby from the preform mold to the final mold and positioning the gob therein;

(g) thereafter releasing the neck mold from the gob and moving the neck mold into the intermediate position; and

(i) thereafter repeating steps (a) through (g), the preform mold being closed generally during at least one of steps (f) and (g).

4,578,100
METHOD OF MAKING NON-GLARE COATED GLASS

J. Shannon Breininger, Gibsonia, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 1, 1985, Ser. No. 718,755

Int. Cl.⁴ C03C *17/44*

U.S. Cl. 65—60.8 **14 Claims**

1. A method for making a non-glare glass article comprising the steps of:

a. contacting a surface of the glass with an alkali silicate composition which forms an alkali silicate coating on said glass surface; and

b. contacting said alkali silicate coating with a compound which removes excess alkali from the coating, said compound selected from the group consisting of acids and salts of weak acids.

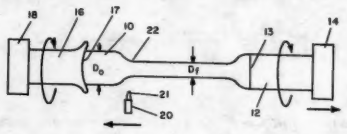
4,578,101
METHOD FOR STRETCHING A GLASS ROD

Harold R. Clark, Plainfield Township, Union County, and David A. Nicol, Hamilton Township, Mercer County, both of N.J., assignors to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Sep. 26, 1984, Ser. No. 654,600

Int. Cl.⁴ C03B *23/04*

U.S. Cl. 65—109 **3 Claims**



1. A method for stretching a solid glass rod comprising the steps of:

reflowing a portion of the rod with a heat source which creates a zone of heat about the rod;

stretching the reflowed portion of the rod to establish a region on the rod where the diameter tapers from the original diameter of the rod to a smaller desired diameter;

reducing the temperature of the heat source to a level sufficient to maintain the reflow of the glass within the tapered diameter region on the rod at a reduced temperature;

progressively reflowing, at said reduced temperature, the portion of the rod not yet reflowed by imparting a relative motion between the heat source and the rod such that the zone of heat moves axially along the rod towards the original diameter portion of the rod; and

stretching the rod as it is progressively reflowed to reduce the diameter of that portion of the rod not previously reduced to the smaller desired diameter.

4,578,102
QUENCHING OR TEMPERING BY MEANS OF A TWO-PHASE JET

Daniel Colmon, and Bernard Letemps, both of Thourotte, France, assignors to Saint-Gobain Recherche, Aubervilliers, France

Filed Aug. 3, 1984, Ser. No. 637,286

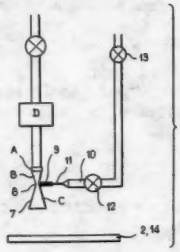
Claims priority, application France, Aug. 5, 1983, 83 12989

Int. Cl.⁴ C03B *27/02*

U.S. Cl. 65—114 **11 Claims**

1. A method of quenching or tempering a glass sheet which comprises directing a jet comprising a gas and liquid onto at

least one face of said glass sheet by means of a nozzle where said gas is supplied at a sufficient pressure to produce a jet



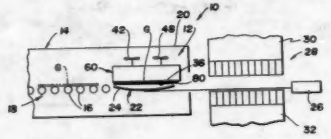
velocity which is at least sonic at the exit of said nozzle, said liquid being atomized prior to exiting said nozzle.

4,578,103

GLASS SHEET PROCESSING SYSTEM INCLUDING TOPSIDE TRANSFER APPARATUS

Lee E. Fackelman, Perrysburg, Ohio, assignor to Glasstech, Inc., Perrysburg, Ohio

Filed Nov. 23, 1984, Ser. No. 674,083
Int. Cl.[4] C03B *23/025, 23/03, 23/035*
U.S. Cl. 65—182.2 **15 Claims**



1. Glass sheet processing apparatus comprising: a horizontal heating conveyor having rolls for conveying glass sheets for heating; a stationary topside transfer platen having a downwardly facing planar surface located adjacent and extending away from the heating conveyor at an elevation just slightly above the rolls thereof to receive heated glass sheets from the heating conveyor; said transfer platen surface including a first set of holes through which a vacuum is drawn to support a heated glass sheet received from the heating conveyor; the transfer platen surface having a second set of holes through which pressurized gas is supplied to space the glass sheet from the surface; and a curved mold that is positioned below the trasfer platen to receive the heated glass sheet therefrom for forming.

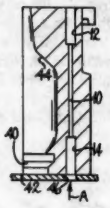
4,578,104

MANUFACTURE OF MOULDED ARTICLES OF GLASSWARE

Stanley P. Jones, Tickhill, England, assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Feb. 27, 1984, Ser. No. 584,067
Int. Cl.[4] C03B *9/38*
U.S. Cl. 65—267 **6 Claims**

1. A mould portion for use in manufacturing articles of glassware, the mould portion having at least one cooling passage extending longitudinally therein so that cooling fluid can flow through the cooling passage and cool the mould portion, wherein the cooling passage comprises a central portion extending through a central region of the mould portion and connecting entrance and exit portions of the cooling passage, so that cooling fluid can flow from the entrance portion into the central portion and from thence into the exit portion, said exit portion being co-axial with said central portion, the central portion being of substantially uniform cross-sectional area, and the exit portion having a greater cross-sectional area throughout than the central portion sufficient to result during flow of



the cooling fluid in reduced heat extraction along the portion of the mould adjacent said exit portion.

4,578,105

STABLE UREAFORM DISPERSION FERTILIZERS

William P. Moore, Hopewell, Va., assignor to Hawkeye Chemical Company, Clinton, Iowa

Filed Jan. 7, 1985, Ser. No. 689,098
Int. Cl.[4] C05C *9/00*
U.S. Cl. 71—28 **18 Claims**

1. A method for producing storage stable ureaform dispersion fertilizers comprising:

(a) admixing between 1 and 3 mols of urea per mol of monomethylolurea in water to form an aqueous solution containing between 10 and 20 percent total nitrogen by weight;

(b) acidifying the aqueous solution to a pH between 3.0 and 4.5 by admixing a mineral acid;

(c) maintaining the acidified solution at a temperature between 25° and 75° C. until the urea and monomethylolurea have reacted sufficiently to form a dispersion of water insoluble ureaform particles containing between 15 and 40 percent of the total nitrogen of the acidified solution;

(d) neutralizing the aqueous dispersion to a pH of 6.5 to 7.5 by admixing a base;

(e) and admixing a water insoluble, film-forming oil with the aqueous dispersion until the dispersed ureaform particles are coated with an amount of oil sufficient to substantially prevent contact between the ureaform particles and the aqueous solution.

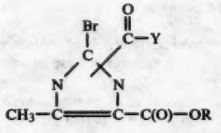
4,578,106

HERBICIDAL ESTERS OF 2-BROMO-4-METHYLIMIDAZOLE-5-CARBOXYLIC ACID

Andrea Leone-Bay, Ridgefield, Conn., and Peter E. Timony, Valley Cottage, N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Sep. 10, 1985, Ser. No. 774,280
Int. Cl.[4] A01N *43/50;* **C07D** *233/90*
U.S. Cl. 71—92 **12 Claims**

7. The method of controlling undesirable vegetation comprising applying to the area where control is desired an herbicidally effective amount of a compound having the structural formula



wherein R is C_1–C_{10} alkyl; C_3–C_8 cycloalkyl, C_3–C_8 cycloalkylalkyl wherein the alkyl has 1 to 6 carbon atoms,

C_3–C_{10} alkenyl, C_5–C_8 cycloalkenyl; benzyl or mono- or di-substituted benzyl wherein the substituents are C_1–C_4 alkyl, halogen, nitro or C_1–C_4 haloalkyl and Y is substituted or unsubstituted phenyl wherein the substituent is (a) nitro; (b) C_1–C_4 alkoxy; (c) C_1–C_4 alkyl; (d) C_1–C_4 haloalkyl; (e) SO_nR^1 wherein R^1 is C_1–C_4 alkyl or C_1–C_4 haloalkyl and n is the integer 0, 1 or 2; or (f) halogen.

4,578,107

HERBICIDAL IMIDAZOLIDINE-2-ONE DERIVATIVES

Tetsuya Imai, Naruto, Japan, assignor to Otsuka Kagaku Kabushiki Kaisha, Osaka, Japan

PCT No. PCT/JP83/00318, § 371 Date May 25, 1984, § 102(e) Date May 25, 1984, PCT Pub. No. WO84/01383, PCT Pub. Date Apr. 12, 1984

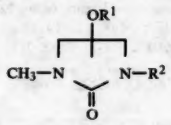
PCT Filed Sep. 27, 1983, Ser. No. 619,149

Claims priority, application Japan, Sep. 27, 1982, 57-169207; Sep. 30, 1982, 57-171311; Feb. 18, 1983, 58-26592

Int. Cl.[4] A01N *43/50*; C07D *233/40*

U.S. Cl. 71—92 **12 Claims**

9. A method of controlling weeds comprising applying to the weeds a herbicidally effective amount of an imidazolidine-2-one derivative represented by the formula:



(I)

wherein R^1 represents hydrogen, lower alkyl, lower alkoxy lower alkyl, benzyl, lower alkoxycarbonyl lower alkyl or lower alkylcarbamoyloxy and R^2 represents —Ar or —CONH—Ar wherein Ar represents phenyl, phenoxyphenyl, benzyloxyphenyl or phenethyloxyphenyl, each of which may be substituted with a halogen atom, nitro group, lower alkyl group, lower alkoxy group or haloalkyl group of 1–3 carbons and up to 3 halogens.

4,578,108

HERBICIDAL BENZENESULFONAMIDES

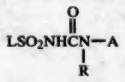
James V. Hay, Newark, and Richard F. Sauers, Hockessin, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 533,773, Sep. 19, 1983, Pat. No. 4,521,241. This application May 3, 1985, Ser. No. 730,156

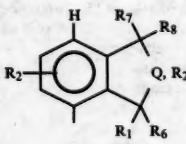
Int. Cl.[4] C07D *401/12*; A01N *43/66, 43/70*; C07D *405/12*

U.S. Cl. 71—93 **18 Claims**

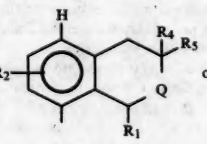
1. A compound having the formula:



where L is



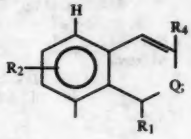
L-1



L-2

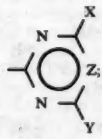
or

-continued



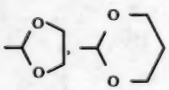
L-3

Q is O, $S(O)_n$ or NR_3;
n is 0, 1 or 2;
R_1 is H, CH_3, Cl or F;
R_2 is H, Cl, Br, C_1–C_3 alkoxy or CF_3;
R_3 is H or C_1–C_4 alkyl;
R_4 is H or CH_3;
R_5 is H or CH_3;
R_6 is H, Cl or F;
R_7 is H and their agriculturally suitable salts, Cl or F;
R_8 is H and their agriculturally suitable salts, Cl or F;
R is H or CH_3;
A is



A-1

X is C_1–C_2 alkyl, C_1–C_2 alkoxy, OCF_2H or CF_3;
Y is H, NH_2, $NHCH_3$, $N(CH_3)_2$, C_1–C_4 alkyl, C_1–C_4 alkyl substituted with 1–3 atoms of (a) F, (b) Cl or (c) Br, CH_2OCH_3, $CH_2OC_2H_5$, C_1–C_4 alkoxy, C_1–C_2 alkylthio, C_3–C_4 alkenyloxy, C_3–C_4 alkynyloxy, $OCH_2CH_2OCH_3$, OCH_2CH_2F, OCH_2CH_2Cl, OCH_2CH_2Br, OCH_2CF_3, $CH(OCH_3)_2$, $CH(OC_2H_5)_2$,



or GCF_2T;
G is O or S;
T is H, CHClF, CHBrF, CF_2H or $CHFCF_3$;
Z is N;
provided that when R_1 is F or Cl, then R_6, R_7 and R_8 are the same as R_1 and Q is O or S; and when R_1 is H or CH_3, then R_6, R_7 and R_8 are H.

4,578,109

PROCESS FOR THE PRODUCTION OF ANODE ACTIVE MATERIALS FOR USE IN CELLS

Kazuhide Miyazaki; Toyohide Uemura, and Katsuzo Nakaso, all of Takehara, Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan

Filed May 17, 1985, Ser. No. 735,229

Claims priority, application Japan, May 17, 1984, 59-97481

Int. Cl.[4] C22C *1/04, 18/00*

U.S. Cl. 75—0.5 C **34 Claims**

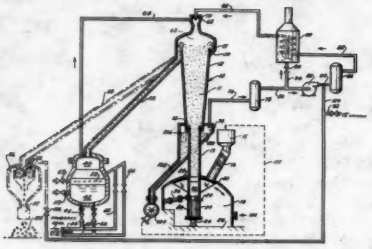
1. A process for the production of anode active materials for use in cells, comprising atomizing a molten zinc to which mercury has been added to obtain pre-amalgamated zinc powder, and dispersing the thus obtained pre-amalgamated zinc powder in a liquid, and contacting the so dispersed zinc powder with mercury or an amalgam to further amalgamate said pre-amalgamated zinc powder.

4,578,110

METHOD OF REDUCING IRON OXIDES

Juan F. Price-Falcón, and Ricardo Viramontes-Brown, both of Nuevo Leon, Mexico, assignors to Hylsa, S.A., Monterrey, Mexico

Filed May 7, 1984, Ser. No. 607,466
Int. Cl.[4] C21B *13/02*; F27B *1/20*
U.S. Cl. 75—34 **19 Claims**



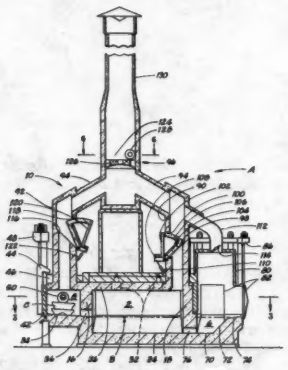
1. A method for the direct gaseous reduction of particulate iron ore to sponge iron in a vertical shaft reactor which comprises gasifying carbon-containing fuel in a gasifier to produce a hot reducing gas, forcing said ore into said reactor near the bottom thereof to form a substantially vertically arranged, self-supporting, upwardly moving ore bed in said reactor, causing said hot reducing gas to flow downwardly through the upwardly moving bed of ore in said reactor to reduce the ore to sponge iron and removing product sponge iron from a point near the top of said reactor.

4,578,111

FURNACE AND PROCESS FOR PROVIDING A SOURCE OF MOLTEN METAL

John R. Gillespie, Ballwin, and Daniel M. Corley, Eureka, both of Mo., assignors to Gillespie & Powers, Inc., St. Louis, Mo.

Filed May 3, 1985, Ser. No. 730,120
Int. Cl.[4] C22B *9/16*; F27B *3/04*
U.S. Cl. 75—65 R **20 Claims**



1. A process for providing a source of molten metal, said process comprising: confining molten metal in a main chamber so that a bath of the molten metal exists in the main chamber; directing a flame into the main chamber to heat the metal in the main chamber and maintain it molten; placing rearwardly large solid pieces of metal in a sweat chamber that is separated from the main chamber by a division wall which contains at least one port through which the sweat chamber communicates with the main chamber, the total cross-sectional area of the port or ports being substantially less than the corresponding cross-sectional area of the chambers beyond either end of the ports; venting the main chamber through the sweat chamber and thence through a vent that leads away from the sweat chamber so as to preheat the solid pieces of metal in the sweat chamber; thereafter directing a flame into the sweat chamber to melt the solid pieces of metal in the sweat chamber allowing the molten metal in the sweat chamber to flow into the bath within the main chamber; and while the flame is directed into the sweat chamber, venting the sweat chamber through the port or ports, the main chamber and another vent that leads away from the main chamber, so that the heat produced in the sweat chamber serves to maintain the bath in the main chamber molten.

4,578,112

CATALYTIC REACTION PROCESS

Toshikatsu Mori, Hitachi; Seizi Takeuchi, Hitachiota; Shimpei Matsuda, Tokai; Teruo Kumagi, Hitachi; Akira Kato, Hitachi; Hisao Yamashita, Hitachi, and Masato Takeuchi, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 347,721, Feb. 10, 1982, which is a continuation of Ser. No. 127,057, Mar. 4, 1980, abandoned.
This application May 2, 1983, Ser. No. 490,517
Claims priority, application Japan, Mar. 12, 1979, 54-29754; Mar. 12, 1979, 54-29755; Mar. 12, 1979, 54-29756; Mar. 12, 1979, 54-29757; Mar. 12, 1979, 54-29758; Mar. 12, 1979, 54-29759
Int. Cl.[4] C22B *3/00*
U.S. Cl. 75—108 **10 Claims**

1. A catalytic reaction process for oxidizing S^{--} or HS^{-} in an aqueous solution, which comprises contacting an aqueous solution containing S^{--} or HSA^{-} ions with an oxidative gas in the presence of a catalyst which is solid in the aqueous solution, said solid catalyst consisting essentially of a non-electroconductive, porous carrier of a hydrophobic polymeric material and a catalytic component containing a metal element having a catalytic activity to S^{--} or HS^{-} in the aqueous solution in the presence of the oxidative gas, wherein a water-repellant agent capable of forming a discontinuous film of the aqueous solution on the surface of the solid catalyst is made co-present with the catalytic component so that said oxidative gas is allowed to arrive at active sites of the catalytic component together with the ions to oxidize the ions.

4,578,113

HIGH STRENGTH STEEL

Mahendrasinh D. Rana, North Tonawanda, and Ronald J. Selines, North Salem, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 496,078, May 19, 1983, Pat. No. 4,461,657.
This application May 14, 1984, Ser. No. 610,012
The portion of the term of this patent subsequent to Jul. 24, 2001, has been disclaimed.
Int. Cl.[4] C22C *38/06*, *38/24*
U.S. Cl. 75—124 **10 Claims**

1. A low alloy steel, particularly suited for a vessel for the storage of gas at pressure, exhibiting leak-before-break behavior, having an ultimate tensile strength of at least 150 thousands of pounds per square inch and a fracture toughness of at least 70 ksi square root inch, consisting essentially of:

(a) from 0.28 to 0.50 weight percent carbon;
(b) from 0.6 to 0.9 weight percent manganese;
(c) from 0.15 to 0.35 weight percent silicon;
(d) from 0.8 to 1.1 weight percent chromium;
(e) from 0.15 to 0.25 weight percent molybdenum;
(f) from 0.005 to 0.05 weight percent aluminum;
(g) from 0.04 to 0.10 weight percent vanadium;

(h) not more than 0.040 weight percent phosphorus;
(i) not more than 0.015 weight percent sulfur;

(j) calcium in a concentration of from 0.8 to 3 times the concentration of sulfur; and
(k) the remainder of iron.

4,578,114

ALUMINUM AND YTTRIUM OXIDE COATED THERMAL SPRAY POWDER

Subramaniam Rangaswamy, Port Jefferson Station, and John H. Harrington, Warwick, both of N.Y., assignors to METCO Inc., Westbury, N.Y.

Continuation-in-part of Ser. No. 597,139, Apr. 5, 1984, abandoned. This application Jul. 3, 1985, Ser. No. 753,803
Int. Cl.[4] B22F *7/02, 7/04*
U.S. Cl. 75—252 38 Claims

1. A thermal spray composite characterized by ability to produce tenacious and corrosion resistant coatings, comprising:
an alloy base constituent comprising at least one metal selected from the group consisting of nickel, iron, cobalt and chromium; and
additional constituents comprising aluminum and yttrium oxide.

4,578,115

ALUMINUM AND COBALT COATED THERMAL SPRAY POWDER

John H. Harrington, Warwick, and Subramaniam Rangaswamy, Port Jefferson Station, both of N.Y., assignors to Metco Inc., Westbury, N.Y.

Filed Apr. 5, 1984, Ser. No. 597,140
Int. Cl.[4] B32B *15/00, 15/18*
U.S. Cl. 75—255 25 Claims

1. A thermal spray composite characterized by ability to produce tenacious and corrosion resistant coatings, comprising:
a base constituent comprising at least one base metal selected from the group consisting of nickel, iron and cobalt, and at least one modifying element selected from the group consisting of chromium and aluminum; and
elemental constituents comprising aluminum and cobalt.

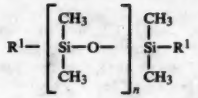
4,578,116

ORGANOSILICON COMPOUNDS AND TEXTILE FIBER FINISHES CONTAINING THESE

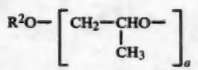
Hans Rott; Götz Koerner, and Günter Schmidt, all of Essen, Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed Oct. 25, 1984, Ser. No. 664,705
Claims priority, application Fed. Rep. of Germany, Oct. 25, 1983, 3338663
Int. Cl.[4] C09D *5/16*
U.S. Cl. 106—18.12 6 Claims

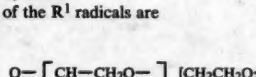
1. Compound of the formula



whereby, in the average molecule
20 to 100% of the R^1 radicals are



in which
R^2 is an alkylphenyl, dialkylphenyl or trialkylphenyl radical and the sum of the alkyl carbon atoms per phenyl radical is 6 to 12,
a=1 to 2; and
0 to 80% of the R^1 radicals are



in which
R^3 is an alkyl radical with 1 to 16 carbon atoms, an organoacyl radical with 1 to 12 carbon atoms or an aryl radical,
b=1 to 2,
c=1 to 30, and
n=3 to 30.

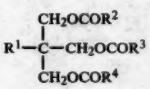
4,578,117

ERASABLE INK COMPOSITION

Mikihiko Nakanishi, Osaka, Japan, assignor to Sakura Color Products Corp., Osaka, Japan

Filed Jun. 20, 1984, Ser. No. 623,762
Claims priority, application Japan, Jun. 22, 1983, 58-113029
Int. Cl.[4] C09D *11/00*
U.S. Cl. 106—20 11 Claims

1. An erasable ink composition for writing on an impervious writing surface to form thereon a writing or marking which is erasable by wiping the surface; the composition consisting of:
about 40–90% by weight of a volatile organic solvent;
about 1–20% by weight of a colorant;
about 0.5–30% by weight of a resin which is soluble in the organic solvent;
about 0–10% by weight of a surfactant;
about 0–12% by weight of an auxiliary separating agent;
about 1–25% by weight of a fatty acid ester of trimethylolalkane of the general formula

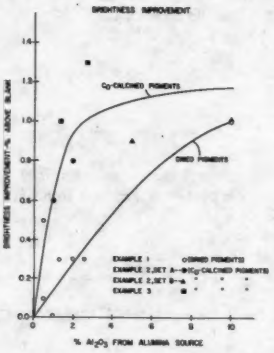


wherein R^1 represents an alkyl of 1–3 carbons, R^2 and R^3 represent independently hydrogen or an alkyl of 1–21 carbons, and R^4 represents an alkyl of 3–21 carbons.

4,578,118
KAOLIN CLAY-BASED PIGMENT

Fred R. Huege, Belle Mead; Richard A. Slepetys, Bricktown, both of N.J., and David L. Catone, Hopkinton, Mass., assignors to Engelhard Corporation, Menlo Park, N.J.

Filed Feb. 13, 1985, Ser. No. 701,110
Int. Cl.[4] C09C *1/22, 1/40*
U.S. Cl. 106—288 B 26 Claims



1. A method of making a white, calcined kaolin clay-based pigment comprises combining an uncalcined, iron compound-containing kaolin clay in fine particulate form with a 0.1 to 15% by weight of alumina and calcining the resultant clay-alumina combination at a temperature of about 870° C. to 1400° C.

4,578,119
METHOD FOR CLEAN-UP OF BLOOD SPILLS

David L. Marcus, 317 E. 10th St., New York, N.Y. 10009, and Peter F. Lordi, P.O. Box 902, Highland, N.Y. 12528

Division of Ser. No. 413,061, Aug. 30, 1982. This application Nov. 7, 1983, Ser. No. 549,498
Int. Cl.[4] B08B *15/00*
U.S. Cl. 134—4 9 Claims

1. A method for absorbing liquid in and destroying the pathogen activity of pathogen contaminated blood spills from a surface without human exposure to the pathogens in the spill, comprising the steps of

(a) contacting said blood spill with a solid, pulverulent composition for absorbing the liquid in the blood spill and physically containing the spill for inhibiting its spread on and further contamination of the surface, said solid pulverulent composition consisting essentially of a sufficient amount of a pourable particulate diatomaceous earth for absorbing the liquid in the blood spill and converting the spill to a substantially solid and readily removable form and a sufficient amount of a chlorine source which is physically and chemically compatible with said diatomaceous earth for providing an available chlorine level in said composition of at least 5,000 ppm;

(b) forming hypochlorous acid by reaction of said chlorine source with water in said blood spill for destroying pathogen activity in said spill on contact therewith;

(c) causing the blood in said spill to change color from red to brown for providing a color indication that pathogen destruction has occurred;

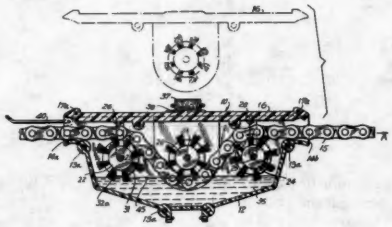
(d) removing the resulting pathogenically inactivated, substantially solid material from the surface; and

(e) disposing of said solid material.

4,578,120
BICYCLE CHAIN CLEANING DEVICE AND METHOD

Michele A. Chiarella, Via Valliorba 22, 6907 Lugano, Switzerland

Filed Jun. 15, 1984, Ser. No. 621,248
Int. Cl.[4] B08B *7/00*
U.S. Cl. 134—9 20 Claims



1. An enclosed device for solvent cleaning of bicycle chains, said device comprising:

(a) an elongated receptacle having means defining an open top and adpapt for enclosing a bicycle chain portion therein, said receptacle having means defining an opening at its opposite ends sized to permit passing the bicycle chain therethrough, said receptacle being further adapted for retaining a solvent liquid in a lower portion thereof;

(b) a mating cover member for closing the top opening of said receptacle, said cover member having at least one primary rotatable sprocket brush attached to the cover and extending into the receptacle, said brush being rotatable about an axis oriented substantially perpendicular to the direction of movement of the bicycle chain when passed through the receptacle, said brush having multiple tufts of bristles located about its periphery, said tufts being spaced apart and sized so as to interfit closely into openings of the bicycle chain passed through the receptacle;

(c) guide means associated with said receptacle for maintaining the bicycle chain in an interfitting relation with said rotatable sprocket brush; and

(d) clamping means attached to said device for retaining the receptacle and the mating cover member together in a closed position, so as to enclose the bicycle chain and retain a solvent liquid material in the lower portion of the receptacle, whereby the bicycle chain can be passed through the receptacle and interfitted with the tufts of said sprocket brush to provide for effective solvent and brush cleaning of the chain.

17. A method for cleaning or lubricating a bicycle chain, said method comprising

(a) filling a receptacle having an open top to a selected level with a solvent or lubricant;

(b) placing a bicycle chain intermediate portion into the receptacle so that the chain extends past opposite ends of the receptacle;

(c) inserting into the receptacle an upper mating member and closing the top opening; said mating member carrying a primary rotary sprocket brush and enclosing the bicycle chain within the receptacle in contact with the solvent or lubricant therein so as to interfit with said primary rotary brush; and

(d) pulling the bicycle chain through the receptacle by tension applied to one end of the chain, thereby contacting the chain with the solvent or lubricant and rotating the primary sprocket brush to interfit with said bicycle chain so as to brush the chain.

4,578,121

METHOD FOR THE CLEANING OF CABLE ENDS

Udo Seidel, Hamburg, Fed. Rep. of Germany, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 6, 1984, Ser. No. 647,737

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1983, 3333760

Int. Cl.[4] B08B 3/10

U.S. Cl. 134—25.4 4 Claims

1. A method for cleaning a bundle of cable ends of a multiconductor transmission cable positioned with its longitudinal axis horizontal, comprising:

providing a manually kneadable, flexible, elongate pouch containing a cleaning fluid,

inserting the bundle of cable ends into the pouch until the open end of the pouch is on the cable sheath with the closed end of the pouch containing the cleaning fluid hanging vertically,

sealing the open end of the pouch around the cable sheath,

moving the closed end of the pouch to a horizontal position to cause the cleaning fluid to be distributed throughout the bundle of cable ends,

manually kneading the pouch to forcefully move the cleaning fluid around and between the cable ends and,

moving the closed end of the pouch back to the vertically hanging position to allow the cleaning fluid to drain off the cable ends.

4,578,122

NON-PEROXIDE TRIVALENT CHROMIUM PASSIVATE COMPOSITION AND PROCESS

David E. Crotty, Highland Park, Mich., assignor to OMI International Corporation, Warren, Mich.

Filed Nov. 14, 1984, Ser. No. 670,384

Int. Cl.[4] C23F 7/26

U.S. Cl. 148—6.2 20 Claims

1. An aqueous acidic peroxide-free solution for treating receptive metal substrates to impart a chromium passivate film thereon comprising chromium ions substantially all of which are present in the trivalent state, hydrogen ions to provide an acidic pH, at least one additional activating metal ion selected from the group consisting of iron, cobalt, nickel, molybdenum, manganese, aluminum, lanthanum, cerium, lanthanide mixtures as well as mixtures thereof present in an amount effective to activate the formation of the chromate passivate film, and nitrate ions as the essential oxidizing agent present in an amount to provide a mol ratio of nitrate ions to chromium ions and activating metal ions of at least about 4:1 and sufficient to activate the hydrated trivalent chromium to form a chromate film on the substrate.

4,578,123

METHOD FOR MANUFACTURING A METALLIC BODY USING AN AMORPHOUS ALLOY

Ludwig Schultz, Bubenreuth, and Franz Gaube, Herzogenaurach, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 7, 1985, Ser. No. 731,507

Claims priority, application Fed. Rep. of Germany, May 16, 1984, 3418209

Int. Cl.[4] C22C 1/00

U.S. Cl. 148—11.5 Q 18 Claims

1. In a method for manufacturing a metallic body using an amorphous alloy formed by at least two predetermined starting alloy partners, said method including the steps of:

producing a preliminary product having respectively adjacent layers of said starting alloy partners with each said respective layer having a thickness of at most 0.001 mm;

developing from said preliminary product an intermediate product having a non-crystalline structure using a rapid diffusion reaction at a predetermined relatively low temperature; and then

further processing said intermediate product to form said metallic body;

the improvement comprising:

forming a starting product by means of a bundling or stacking technique from a predetermined number of mutually adjacent parts of said respective starting alloy partners; and

reducing the thickness of said starting product by at least one cross-section reducing treatment to provide said preliminary product having predetermined adjacent layer thicknesses.

4,578,124

HIGH STRENGTH LOW CARBON STEELS, STEEL ARTICLES THEREOF AND METHOD FOR MANUFACTURING THE STEELS

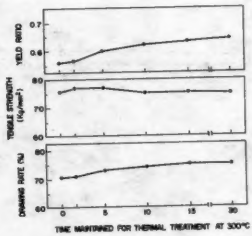
Toshiaki Yutori, Hyogo; Masatoshi Sudo, Kobe; Takehiko Kato, Kobe, and Yasuhiro Hosogi, Kobe, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Dec. 27, 1984, Ser. No. 686,884

Claims priority, application Japan, Jan. 20, 1984, 59-9055; Jan. 20, 1984, 59-9056; Aug. 24, 1984, 59-177191

Int. Cl.[4] C21D 7/14

U.S. Cl. 148—12 F 15 Claims

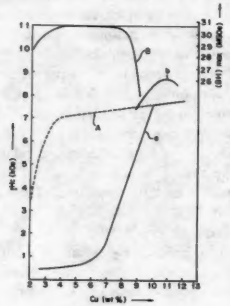


1. A high strength low carbon steel having good ultraworkability which consists essentially of 0.01–0.3 wt% of C, below 1.2 wt% of Si, 0.3–2.5 wt% of Mn and the balance of iron and inevitable impurities, the steel having such a metal structure that a low temperature transformation product phase having an average calculated size not larger than 3 microns consisting of acicular martensite, bainite or a mixed structure thereof is uniformly dispersed in a ferrite phase in an amount by volume of 15–40%.

4,578,125
PERMANENT MAGNET

Masashi Sahashi, Fujisawa; Koichiro Inomata; Naoyuki Sori, both of Yokohama, and Hideki Yamamiya, Yamato, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 28, 1982, Ser. No. 392,593
Claims priority, application Japan, Jul. 3, 1981, 56-103434; Oct. 2, 1981, 56-156203
Int. Cl.[4] C04B *35/00*
U.S. Cl. 148—31.57 4 Claims



1. A permanent magnet produced by a process comprising the steps of:

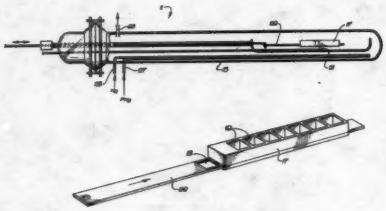
(a) sintering a powdered alloy comprising from about 25 to about 29% by weight of samarium from about 0.2 to about 3% by weight of titanium, from about 3 to about 9% by weight of copper, from about 10 to 20% by weight of iron and the balance consisting essentially of cobalt to obtain a sintered body; and

(b) annealing the sintered body at a cooling rate of not more than about 5° C./min from an annealing initiating temperature of from about 600° to 700° C.

4,578,126
LIQUID PHASE EPITAXIAL GROWTH PROCESS

Edward A. Rezek, Redondo Beach, and Lawrence M. Zinkiewicz, West Hollywood, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Jun. 22, 1983, Ser. No. 506,683
Int. Cl.[4] H01C *21/208*
U.S. Cl. 148—171 18 Claims



1. A method for producing a high-resistivity epitaxial layer on a semiconductor substrate comprising steps of:

dissolving a prescribed amount of cobalt as a deep level dopant in an indium solvent, the step of dissolving including a step of baking the dopant and solvent in a prescribed fashion, to produce a purified intermediate solution having an impurity concentration of less than about 1×10^{16} atoms per cubic centimeter;

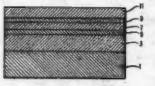
adding to the purified intermediate solution a semiconductor selected from the group consisting of indium phosphide, gallium arsenide, indium arsenide and mixtures thereof, and baking the resultant solution in a prescribed fashion, to produce a purified final solution having an impurity concentration of less than about 1×10^{16} atoms per cubic centimeter and having prescribed relative proportions of the deep level dopant and the semiconductor material; and

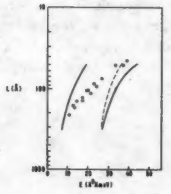
cooling the purified final solution to a temperature below its liquidus temperature, in the presence of a semiconductor substrate, to grow on the substrate an epitaxial layer of the doped semiconductor material, the resulting epitaxial layer having a resistivity substantially higher than that of an undoped epitaxial layer of the same semiconductor material.

4,578,127
METHOD OF MAKING AN IMPROVED GROUP III-V SEMICONDUCTOR DEVICE UTILIZING A GETTER-SMOOTHING LAYER

Arthur C. Gossard, Warren; Robert C. Miller, Summit, and Pierre M. Petroff, Westfield, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 13, 1982, Ser. No. 408,009
Int. Cl.[4] H01L *21/203, 21/363*
U.S. Cl. 148—175 7 Claims





1. A method of fabricating a semiconductor device having at least one Group III–V semicondcutor comprising the steps of:

growing a getter-smoothing layer on a semiconductor surface thereby gettering or desorbing impurities from the semiconductor surface, said getter-smoothing layer comprising a semiconductor and having a thickness between 10 and 100 Angstroms;

growing a cladding layer comprising a semiconductor, said cladding layer having a thickness less than 1500 Angstroms, said cladding layer being contiouous with said getter-smoothing layer;

and growing a single active layer comprising a semiconductor.

4,578,128
PROCESS FOR FORMING RETROGRADE DOPANT DISTRIBUTIONS UTILIZING SIMULTANEOUS OUTDIFFUSION OF DOPANTS

Randall S. Mundt, and Ray E. Wyatt, both of Colorado Springs, Colo., assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 3, 1984, Ser. No. 677,636
Int. Cl.[4] H01L *21/20, 21/225*
U.S. Cl. 148—191 8 Claims

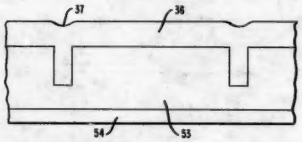
1. A process for forming a vertical retrograde dopant distribution in a semiconductor device, comprising:

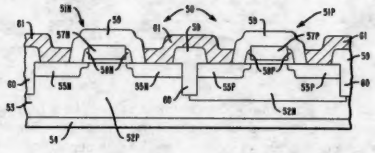
providing a substrate of a first conductivity type;

forming on the substrate an epitaxial layer of the second conductivity type and of selected thickness;

forming a mask on the epitaxial layer exposing a first well region and a covered second well region;

doping the surface region of the epitaxial layer in the first well region;





removing the mask to expose both well regions; and

heating the structure for a predetermined time and temperature to form by outdiffusion a retrograde dopant distribution of the first conductivity type in the first well region and to form a retrograde dopant distribution of the second conductivity type in the adjacent second well region.

4,578,129

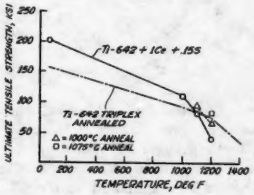
OXYSULFIDE DISPERSION STRENGTHENED TITANIUM ALLOYS

Raymond G. Rowe, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 15, 1985, Ser. No. 702,203

Int. Cl.[4] C22C *14/00, 1/18*

U.S. Cl. 148—407 **7 Claims**



3. A titanium base alloy containing appreciable concentrations by weight percent of aluminum, tin and zirconium,

said alloy having distributed therein a fine dispersoid of a metal compound of high chemical stability,

said compound being formed of at least one metal and at least one nonmetal,

said nonmetal being oxysulfide,

said metal being selected from the group consisting of calcium, cerium, gadolinium, praesodynium, lanthanum, yttrium and strontium.

4,578,130

IRON-NICKEL-CHROMIUM ALLOY HAVING IMPROVED SWELLING RESISTANCE AND LOW NEUTRON ABSORBENCE

Michael K. Korenko, Richland, Wash., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 61,228, Jul. 27, 1979, abandoned. This application Aug. 22, 1980, Ser. No. 180,770

Int. Cl.[4] C22C *30/00*

U.S. Cl. 148—419 **1 Claim**

1. An iron-nickel-chromium age hardenable alloy characterized in having γ' and γ'' phases present and consisting essentially of about 37% nickel, 12% chromium, 2.9% niobium, 0.2% silicon, 0.05% zirconium, 1.75% titanium, 0.3% aluminum, and the remainder essentially all iron.

4,578,131

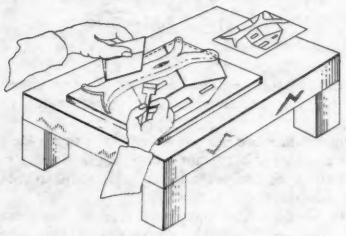
METHOD OF MAKING A THREE DIMENSIONAL SCULPTURED PAINTING

Floyd A. Hawkins, Jr., Rte. 1, Box 476, Stanardsville, Va. 22973

Filed Nov. 14, 1984, Ser. No. 671,189

Int. Cl.[4] B44D *5/10*

U.S. Cl. 156—62 **3 Claims**



1. A method of creating a three dimensional sculptured painting comprising the steps of: securing a fabric to a fiberboard sheet; applying a base coat of a first sand and glue mixture to the fabric; scoring the base coat to define a picture; applying a second sand and glue mixture with a higher sand to glue ratio than said first mixture to desired portions of the defined picture to build up areas of the picture and sculpturing said second mixture to create three dimensional detail; and, after drying, painting the picture to complete the details of an object or scene which forms the picture.

4,578,132

PROCESS FOR THE PRODUCTION OF TUFTED CARPET TILES

Adrianus A. Van Uden, Tiel, and Johannes A. H. Claessen, Leusden, both of Netherlands, assignors to Heuge Export AG, Luzern, Switzerland

Filed Sep. 23, 1983, Ser. No. 535,371

Claims priority, application Netherlands, Sep. 23, 1982, 8203691

Int. Cl.[4] D05C *15/04;* D06C *7/00;* D06P *5/20*

U.S. Cl. 156—72 **3 Claims**

1. In a process for the production of tufted carpet tiles comprising making a tufted carpet web by tufting one surface of a substrate with a pile yarn, providing the tufted substrate on the other surface with a coating of a rubber latex and with a tile backing selected from the group consisting of bitumenous materials and synthetic resins to provide a raw carpet web, and thereafter dyeing, steaming, washing and drying said raw carpet web and subsequently cutting tiles from said carpet web, the improvement comprising:

A. subsequent to the steps of coating and application of said

tile backing and prior to the step of dyeing thereof, heat treating said raw carpet web by:

(i) freely supporting said web in an untensioned condition upon an auxiliary carrier so as to permit said web to shrink freely and stress relieve,

(ii) exposing said supported web to a temperature of 120°—200° C. for 1 to 8 minutes, and

(iii) cooling said web to a temperature below 50° C.; and

B. between said dyeing and steaming steps, imprinting said carpet web with a pattern.

4,578,133

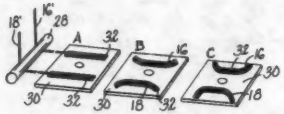
METHOD AND APPARATUS FOR APPLYING DISCRETE STRIPS TO A WEB OF MATERIAL

Daniel J. Osbefsky; Paul A. Gavronski; Robert E. Vogt, and Gregory J. Rajala, all of Winnebago County, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Nov. 19, 1984, Ser. No. 673,064

Int. Cl.[4] B29H *15/00*; B60C *29/00*; B44C *1/16*; B32B *31/00*

U.S. Cl. 156—164 **19 Claims**



1. A method of applying discrete strips of a first material in a predetermined pattern to a web of a second material comprises:

supplying one or more discrete strips of the first material to one or more transfer members carrying flexible strip supports thereon and adhering the supplied strips to the flexible strip supports;

cutting the strips of first material to form one or more discrete strips thereof adhering to the flexible strip supports of the transfer members;

changing the configuration of the flexible strip supports while the supplied strips of first material are adhered thereto, thereby correspondingly changing the configuration of the supplied strips; and

moving the one or more transfer members and the web of second material into transfer contact with each other and transferring the supplied strips in their changed configuration to the web of the second material.

4,578,134

PROCESS FOR THE PRODUCTION OF SPUNBONDED FABRICS FROM AERODYNAMICALLY DRAWN FILAMENTS

Ludwig Hartmann, Pascalstr. 3, 6750 Kaiserslautern, Fed. Rep. of Germany

Filed Jul. 2, 1984, Ser. No. 627,198

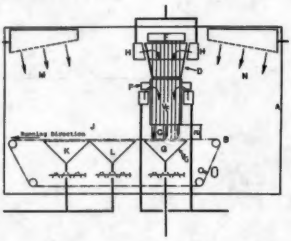
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1984, 3400847

Int. Cl.[4] D04H *3/16*

U.S. Cl. 156—167 **9 Claims**

1. A process for the production of spunbonded fabrics in a spinning room by aerodynamically drawing filaments or filament rovings with the aid of air currents divided into component currents and supplied to a perforated collecting screen where they are deposited in random texture, are held in this position by air suction and supplied to a bonding aggregate,

wherein the air current is divided into a conditioning current and a drawing current for the conduction and the drawing of the filaments or filament rovings and into a deposition zone current for the fixation of the web, which has been deposited in random texture, in its transportation on the perforated collecting screen, the deposition zone current being sucked off through the collecting screen together with the spinning room air in a plurality of zones and being reintroduced into the spinning room as a holding current, and an additional spinning room current being introduced into the spinning room for balancing out the overall system, the conditioning current as well as the drawing current being introduced in solely added air mode and the depositing current and the holding current being withdrawn and introduced, respectively, in mostly recirculated mode, and



wherein the spinning room current is supplied in mixed recirculated air/added air mode or in solely added air mode and the air velocities, as the filaments are being sucked off the holding zone on the collecting screen, are lowered in the running direction, whereby, by means of the aforementioned air conduction of the component currents, the concentration of suspended particles is reduced in the opposite direction.

4,578,135

FUEL CELL ELECTROLYTE MATRIX AND METHOD FOR MANUFACTURING THE SAME

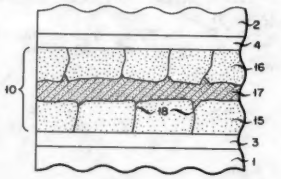
Mitsushi Ueno, Yokohama; Tamotsu Shirogami, Yamato, and Noboru Segawa, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 1, 1984, Ser. No. 576,011

Claims priority, application Japan, Mar. 31, 1983, 58-56002

Int. Cl.[4] B32B *31/00*; C09J *5/04*

U.S. Cl. 156—182 **6 Claims**



1. A method for manufacturing a fuel cell electrolyte matrix which comprises the steps of:

providing a fuel electrode and oxidizing electrode respectively coated with a catalyst layer on one side;

forming a powder layer prepared from electrolyte-resistive material on the surface of at least one of said catalyst layers;

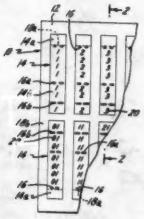
spreading a paste layer prepared from a mixture of acid electrolyte and powdery electrolyte-resistive material on the powder layer or catalyst layer coated on the fuel electrode and/or the powder layer or catalyst layer coated on the oxidizing electrode;

tightly superposing the fuel electrode and oxidizing electrode with the paste layer and powder layer interposed therebetween, thereby forming an electrolyte matrix between both electrodes.

4,578,136
ADHESIVE PRODUCTS

Barry D. Brown, Reno, Nev., assignor to The Datak Corporation, Guttenberg, N.J.

Continuation of Ser. No. 371,339, Apr. 28, 1982, abandoned.
This application May 7, 1984, Ser. No. 608,266
Int. Cl.[4] B32B 31/00
U.S. Cl. 156—249 16 Claims

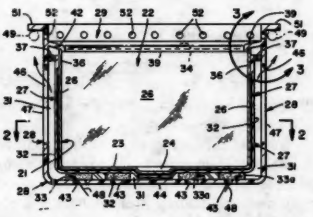


1. An article of manufacture, including a carrier having a release surface, and a marker including a one-piece, relatively long and narrow strip of material comprising at least three serially related segments including a first-end segment and at least two additional segments divided by graded weakening formations that result in transversely rupturable connections between the segments that are all successively weaker in tension in the order of their distances from the first-end segment, each of said additional segments bearing pressure-sensitive adhesive and being adhered thereby to said release surface, whereby, after the marker has been peeled from the carrier by a user who grasps only said first-end segment, and after the segment remote from said first-end segment has been adhered to a receptor and retained thereon, the unadhered segments of the marker can be torn away from the adhered segment by directly pulling only the grasped first-end segment of the marker.

4,578,137
CHEMICAL BATH APPARATUS AND SUPPORT ASSEMBLY

Charles J. Kring, Berkeley, Calif., assignor to Wafab, Inc., San Ramon, Calif.

Filed Jan. 23, 1984, Ser. No. 572,940
Int. Cl.[4] C23F 3/02
U.S. Cl. 156—345 7 Claims



1. In a chemical bath apparatus including an open topped beaker formed with a continuous bottom wall and a continuous side wall for containment of a chemical substance in said beaker during heating, heater means mounted to the exterior of at least one of said bottom wall and said side wall for heating of said chemical substance therethrough, said heater means terminating in a heater periphery, open topped shell means having a bottom wall and a side wall, said shell means extending around said beaker and said heater means, spacing means between said shell means and said beaker for maintaining said shell means in spaced relation to said side wall of said beaker to provide a space between said side wall of said beaker and said shell means, and a support and seal assembly supporting said beaker with respect to said shell means and substantially sealing and isolating said heater means from corrosive fumes produced upon heating of said chemical substances in said beaker, wherein the improvement in said chemical bath apparatus comprises:

said support and seal assembly including:

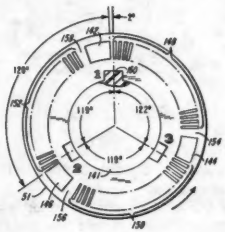
(a) sleeve means extending around and enclosing said heater means and being mounted in sealed relation to the exterior of said beaker at locations extending beyond said heater periphery, said sleeve means being imperforate and formed of a material which is highly temperature resistant and corrosion resistant to provide a substantially fume impervious barrier positioned and sealed to said beaker at said locations beyond said heater periphery; and

(b) resilient, corrosion resistant, pad means positioned between said shell means and said beaker over a substantial area of said bottom wall of said beaker to provide resilient vertical support of substantially the entire weight of said beaker with said chemical substance therein through said bottom wall of said beaker and for maintaining said bottom wall of said shell means in spaced relation to said bottom wall of said beaker.

4,578,138
HAND-HELD LABELER HAVING ADJUSTABLE WEB POSITIONING SYSTEM

Paul H. Hamisch, Jr., Franklin; James L. Vanderpool, Kettering, and James M. Bain, Xenia, all of Ohio, assignors to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Apr. 3, 1984, Ser. No. 596,334
Int. Cl.[4] B65C 9/18, 11/02
U.S. Cl. 156—361 27 Claims



1. A hand-held labeling machine comprising; a housing having a manually engageable handle, the housing having means for holding a label supply roll of a composite web having labels releaseably adhered to a backing strip, means for printing on a label at a printing position, means for peeling the printed label from the backing strip, label applying means disposed adjacent the peeling means, means for advancing the web to peel a printed label from the backing strip at the peeling means and advance the printed label into label applying relationship with the label applying means and to advance another label into the printing position, means for entering selected data to be printed, the printing means including a thermographic print head having a plurality of individually selectable print elements for printing on a thermographic label at a printing position, means coupled to said data entering means for electrically processing the selected data and energizing the individual print elements in a predetermined sequence determined by the selected data to print data on the label, wherein said advancing means includes indexing means coupled to said processing means for providing signals representative of the position of a label to said processing means, said indexing means including a circular member having three home position

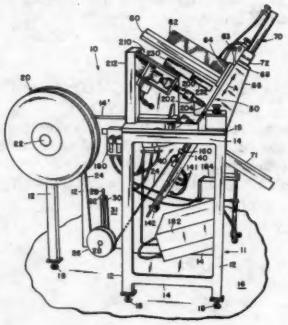
indices and a plurality of position indices interposed between said home position indices, said circular member being adapted to be driven by a shaft, said indexing means including means for fixedly attaching said circular member to said shaft while providing an angular adjustment between said circular member and said shaft, said adjusting means including keying means disposed on said shaft and first, second and third engaging means disposed on said circular member for engaging said keying means, said keying means and said engaging means cooperating to prevent rotation of said circular member relative to said shaft, wherein said first engaging means is disposed $120° + 2N°$ from said second engaging means, said third engaging means being spaced from said second and first engaging means by $120° - N°$ to permit a $\pm N°$ adjustment of said circular member relative to said shaft.

4,578,139

TAG MANUFACTURING APPARATUS

William J. Stehouwer, Lansing, Mich., assignor to A. J. Sparks & Company, Grand Rapids, Mich.

Filed Feb. 2, 1984, Ser. No. 576,438
Int. Cl.[4] B65C *7/00, 9/10*
U.S. Cl. 156—384 **21 Claims**



A machine for attaching tag ties to the bodies of tabs comprising:

a machine frame;

means at a first position on said machine frame for holding a supply of tag bodies;

first means on said frame for moving individual tag bodies from said holding means at said first position to a second position on said machine frame;

tag tie supplying means and means on said frame for moving tag ties from a third position on said machine frame to said second position and in alignment with a tag body; and

means for securing a tag tie to a tag body at said section position, wherein said first, second and third positions lie substantially in a line and wherein said second position is located between said first and third positions such that tab bodies and tag ties are moved toward each other from opposite directions.

4,578,140

CASSETTE TYPE LABELER AND CASSETTE CASE

Toshio Nakajima, Tokyo, Japan, assignor to Teraoka Seiko Co., Ltd., Tokyo, Japan

Filed Jul. 16, 1982, Ser. No. 398,901
Claims priority, application Japan, Jul. 21, 1981, 56-114078; Jul. 29, 1981, 56-118996; Aug. 5, 1981, 56-122684
Int. Cl.[4] B32B *35/00*
U.S. Cl. 156—384 **61 Claims**

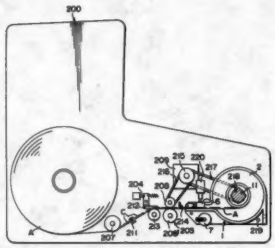
1. A cassette case adapted to be used with a labeler body having a drive roller, wherein said cassette case comprises a case body comprising:

(a) an outlet opening;

(b) a labelled base sheet having at least one label on a base sheet and stored in a roll form in said case body, wherein said labelled base sheet is adapted to be extracted through said outlet;

(c) a peeling member positioned near said opening for curving said labelled base sheet to the rear so as to peel off each said label from the base sheet to provide a peeled-off base sheet;

(d) guide means disposed rearward of said peeling member and a feed roller for feeding the peeled-off base sheet in a



predetermined direction, wherein said guide means comprises a curved base adapted to cooperate with said drive roller on said labeler body for moving said base sheet through said cassette case such that said base sheet is disposed between said feed roller and said guide members; and

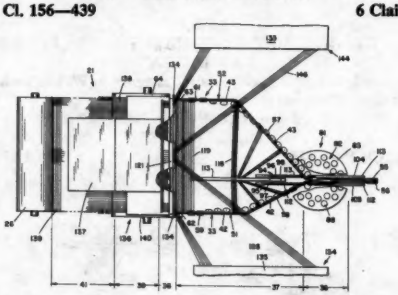
(e) means for elastically pressing said feed roller against said guide means to maintain said backing sheet between said guide means and said feed roller.

4,578,141

WEFT FORMING APPARATUS

Lester Gidge, Nashua, and Ronald P. Murro, Amherst, both of N.H., assignors to Bay Mills Limited, Toronto, Canada

Filed Jan. 13, 1984, Ser. No. 570,385
Int. Cl.[4] B32B *5/12*; D04H *3/05*
U.S. Cl. 156—439 **6 Claims**



1. A weft forming section of a machine for forming a sheet of yarns, said section comprising:

endless weft strand carrier means including a pair of laterally spaced stretches, mounted to advance longitudinally along a generally horizontal path through said section;

weft supply means including a turret having a plurality of packages thereon and rotatable in a horizontal plane on a vertical axis and;

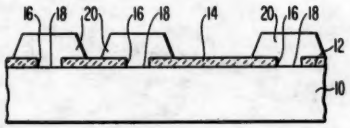
endless draw-off means including a pair of parallel, spaced apart endless belt stretches, advancing longitudinally in a plane parallel to the plane of said turret along said path and having a plurality of pairs of draw-off pins spaced therealong;

said weft supply mans and said draw-off means being oprably connected to individually and successively draw-off a full width length of weft strand from each package, cut it off and deliver it to said endless weft strand carrier means.

4,578,142
METHOD FOR GROWING MONOCRYSTALLINE SILICON THROUGH MASK LAYER

John F. Corboy, Jr., Ringoes; Lubomir L. Jastrzebski, Plainsboro; Scott C. Blackstone, Hopewell, and Robert H. Pagliaro, Jr., Trenton, all of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed May 10, 1984, Ser. No. 608,544
Int. Cl.[4] C30B *25/04*
U.S. Cl. 156—612 16 Claims



1. A method for forming monocrystalline silicon through a mask layer comprising:

providing a semiconductor substrate having a monocrystalline portion at a surface thereof and having a mask layer on said surface, the mask layer having an aperture to said monocrystalline portion;

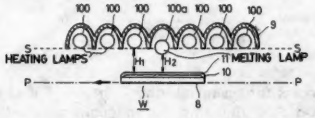
depositing silicon for a period substantially equal to a critical time, from a silicon-source gas, so as to form monocrystalline silicon on exposed monocrystalline silicon regions and non-monocrystalline silicon on the mask layer, said critical time being a time at which said non-monocrystalline silicon can be removed from the mask layer by etching in situ while retaining a portion of the deposited monocrystalline silicon; and

etching in situ directly after said depositing, in a silicon-etching gas, so as to remove the non-monocrystalline silicon from the mask layer while retaining a portion of the deposited monocrystalline silicon and achieve a monocrystalline silicon island extending from the substrate surface at the mask aperture.

4,578,143
METHOD FOR FORMING A SINGLE CRYSTAL SILICON LAYER

Tetsuji Arai, Kobe, Japan, assignor to Ushio Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 25, 1983, Ser. No. 526,453
Claims priority, application Japan, Aug. 26, 1982, 57-146940
Int. Cl.[4] C30B *1/08*
U.S. Cl. 156—617 R 5 Claims



1. A process for forming a single crystal silicon layer by heating a wafer, which is made of a single crystal silicon substrate and a starting silicon layer made of amorphous or polycrystalline silicon and provided on the silicon substrate, in accordance with the epitaxial growth technique, which process comprises the following steps:

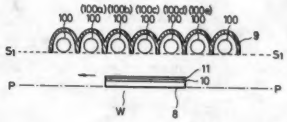
providing a heat source which comprises a plurality of tubular lamps provided side by side with their longitudinal axes extending substantially in parallel with one another in a second plane lying above and substantially in parallel with a first plane, in which the wafer is placed, and a tubular melting lamp provided at a position between the first and second planes and with its longitudinal axis substantially in parallel with the longitudinal axes of the tubular lamps in the second plane; and

moving the wafer in the first plane and in a direction perpendicular to the longitudinal axes of the tubular lamps, all the tubular lamps of the heat source, including the tubular melting lamp, being lit, to form a narrow molten region on the wafer so as to convert the starting silicon layer into the single crystal silicon layer.

4,578,144
METHOD FOR FORMING A SINGLE CRYSTAL SILICON LAYER

Tatsumi Hiramoto, Machida, Japan, assignor to Ushio Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 25, 1983, Ser. No. 526,456
Int. Cl.[4] C30B *1/08*
U.S. Cl. 156—617 R 9 Claims



1. A process for forming a single crystal silicon layer by heating a wafer, which is made of a single crystal silicon substrate and a starting silicon layer made of amorphous or polycrystalline silicon and provided on the silicon substrate, in accordance with the epitaxial growth technique, which process comprises the following steps:

providing a heat source which comprises a plurality of tubular lamps provided side by side with their longitudinal axes extending substantially in parallel with one another in a second plane lying above and substantially in parallel with a first plane in which the wafer is placed;

lighting the tubular lamps of the heat source to radiate their light to the wafer so that the wafer is heated and the temperature of the starting silicon layer is maintained at 1100°–1400° C. for 4 seconds or longer; and then,

radiating light from a specific lamp which is one of the tubular lamps and is lit with an excess input greater than the remaining lamps to a portion of the starting silicon layer of the wafer so as to raise the temperature of the portion of the starting silicon layer to 1410°–1480° C. and to form a narrow molten region, and moving the wafer in the first plane, in a direction perpendicular to the longitudinal axes of the tubular lamps and at a speed of at least 0.1 cm/sec. relative to the tubular lamps so as to form the same narrow molten regions as the former narrow molten region successively one after another in the wafer, thereby converting the starting silicon layer into the single crystal silicon layer.

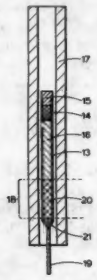
4,578,145
METHOD OF MAKING MONOCRYSTALLINE TERNARY SEMICONDUCTOR COMPOUNDS

Brian E. Bartlett, Hampshire; James E. Harris, Southampton, and John G. Wilkes, Ashurst, all of England, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 164,420, Jun. 30, 1980, abandoned.
This application Sep. 9, 1982, Ser. No. 416,210
Claims priority, application United Kingdom, Jul. 5, 1979, 7923412
Int. Cl.[4] C30B *11/02*
U.S. Cl. 156—616 R 7 Claims

1. A method of making a monocrystalline ternary semiconductor compound material comprising the steps of preparing a melt of said semiconductor compound, quenching said melt so as to produce a polycrystalline ingot and then melting a portion of said ingot to thereby allow a crystal nucleus to form and

then propagating a single crystal growth through the remainder of said ingot, characterized in that said single crystal growth in the remainder of said ingot is propagated by passing



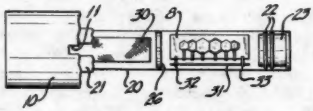
a single molten zone through said ingot at a rate of from 0.1 to 2 mms per hour, said molten zone having a length which is from 25 to 40% of the length of said ingot.

4,578,146

PROCESS FOR GROWING A LARGE SINGLE CRYSTAL FROM MULTIPLE SEED CRYSTALS

Bruce H. Chai, Bridgewater; Ernest Buehler, Chatham; John J. Flynn, Millington, and Robert C. Morris, Ledgewood, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.Y.

Filed Apr. 28, 1983, Ser. No. 489,450
Int. Cl.[4] C30B *7/10*
U.S. Cl. 156—623 R **10 Claims**



1. In a hydrothermal process for growing a metal orthophosphate selected from the group consisting of alpha-aluminum orthophosphate and alpha-gallium orthophosphate, in which a crystal is grown from a seed crystal in an acid medium at elevated temperatures, an improvement consisting essentially of growing one crystal from a plurality of seed crystals, each seed crystal having at least two substantially planar surfaces and being mounted so that a first planar surface is substantially in contact with a first planar surface of an adjoining seed crystal along their common length and a second planar surface is substantially parallel to a second planar surface of the adjoining seed crystal.

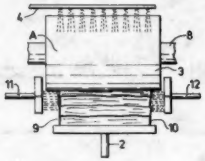
4,578,147

PROCESS FOR MANUFACTURING GROUNDWOOD PULP WHILE MAINTAINING A HIGH AND UNIFORM MOISTURE CONTENT IN THE WOOD IN THE GRINDING ZONE

Jonas A. I. Lindahl, Domsjo, and Gustaf E. Johnsson, Umea, both of Sweden, assignors to Mo och Domsjo Aktiebolag, Ornskoldsvik, Sweden

Continuation of Ser. No. 281,433, Jul. 8, 1981, abandoned. This application Mar. 1, 1983, Ser. No. 470,903
Claims priority, application Sweden, Jul. 9, 1980, 8005035
Int. Cl.[4] D21C *1/12, 1/16*
U.S. Cl. 162—26 **12 Claims**

1. A process for manufacturing from wood logs groundwood pulp of uniform quality by maintaining a high and uniform moisture content in the wood logs in the grinding zone, which comprises grinding wood logs by thrusting the wood logs contained in at least one wood log pocket against the surface of a rotating grindstone in a pocket grinder while applying shower water both onto the free surfaces of the grindstone at an acute angle and directly into the grinding zone area where the wood logs in each pocket and the grindstone are in surface contact with each other and to the wood log charge located immediately above the surface of the grindstone at at least one end portion of the wood logs and in substantially



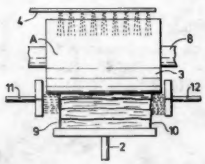
parallel alignment with the longitudinal axis of the wood logs at an angle within the range from about 0° to about 60° while controlling the total flow of shower water so that the total volume of water introduced directly into the grinding zone is within the range from about 50 to about 600 liters/minute, for each ton of pulp produced per hour, in a sufficient amount to prevent drying of the wood logs in the course of the frictional heating resulting from their being thrust against the surface of the grindstone, and thus holding the moisture content of the wood logs at a high and uniform level.

4,578,148

PROCESS FOR MANUFACTURING BRIGHT AND STRONG BLEACHED GROUNDWOOD PULP OF UNIFORM QUALITY

Jonas A. I. Lindahl, Domsjö , Sweden, assignor to Mo och Domsjo Aktiebolag, Ornskoldsvik, Sweden

Continuation of Ser. No. 479,587, Mar. 28, 1983, abandoned, which is a continuation of Ser. No. 281,434, Jul. 8, 1981, abandoned. This application Nov. 1, 1984, Ser. No. 667,314
Claims priority, application Sweden, Jul. 9, 1980, 8005034
Int. Cl.[4] D21C *1/16*
U.S. Cl. 162—26 **20 Claims**



1. A process for manufacturing from wood logs bleached groundwood pulp of improved and unform quality, which comprises thrusting wood logs contained in at least one wood log pocket of a pocket grinder against the surface of a rotating grindstone while applying shower water onto the free surfaces of the grindstone at an acute angle and applying shower water containing bleaching chemicals directly to the grindstone within the grinding zone where the wood logs in each pocket and the grindstone are in surface contact with each other and to the wood log charge located immediately above the surface of the grindstone at at least one end portion of the wood logs and in substantially parallel alignment with the longitudinal axis of the wood logs at an angle within the range from about 0° to about 60° while controlling the total flow of shower water so that the total volume of water introduced directly into the grinding zone is within the range from about 50 to

about 600 liters/minute, for each ton of pulp produced per hour, in a sufficient amount to prevent drying of the wood logs in the course of the frictional heating resulting from their being thrust against the surface of the grindstone, and thus holding the moisture content of the wood logs at a high and uniform level, while bringing the wood logs into effective contact with bleaching chemicals at an early stage, resulting in a pulp of high brightness.

4,578,149

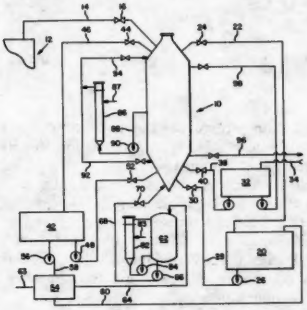
PROCESS FOR DIGESTING CELLULOSIC MATERIAL WITH HEAT RECOVERY

Bertil K. E. Fagerlund, Praestvaegen 10, 18402 Osterskaer, Sweden

Continuation-in-part of Ser. No. 240,804, Mar. 5, 1981, abandoned. This application Oct. 18, 1982, Ser. No. 434,758

Int. Cl.[4] D21C *11/00*

U.S. Cl. 162—39 **10 Claims**



1. In a batch digesting process wherein a digester is charged with a mass of cellulosic material and digesting liquor and the charge is then cooked at an elevated temperature and superatmospheric pressure to obtain within said digester, a column of delignified pulp and hot spent liquor, the improvement comprising:

after digestion of said cellulosic material, and while maintaining said column of delignified pulp substantially intact, quantitatively displacing the hot spent liquor under pressure by pumping into said digester a first volume portion of a lower temperature liquid, the volume thereof being approximately equal to the liquid carrying capacity of said digester, forcing said hot spent liquor out the top of said digester to a high temperature accumulator substantially at said super atmospheric pressure, quantitatively displacing liquor remaining in said digester out of the top of the digester by pumping a second volume portion of said lower temperature liquid into the digester, and

while maintaining said hot spent liquor at said superatmospheric pressure, transferring said hot spent liquor to a second mass of cellulosic material to thereby conserve and utilize the sensible heat of said hot spent liquor under pressure to preheat said second mass of cellulosic material.

4,578,150

FIBROUS MEDIA CONTAINING MILLIMICRON-SIZED PARTICULATES

Kenneth C. Hou, San Antonio, Tex., assignor to AMF Inc., White Plains, N.Y.

Filed Jul. 23, 1982, Ser. No. 401,361

Int. Cl.[4] D21H *3/60*

U.S. Cl. 162—164.3 **43 Claims**

1. In a process of fabricating a self-supporting fibrous matrix containing immobilized therein particulate material comprising:

(a) forming an aqueous slurry containing inorganic microparticulate material and cellulose fibers having a CSF of +400 to +800 ml; and

(b) vacuum felting said slurry to thereby form said self-supporting fibrous matrix; the improvement wherein

said microparticulate material is at least about 5% by weight of a microparticulate material having an average diameter less than 1 microm, and wherein step (b) is carried out in the presence of flocculating amounts of neutral organic polymeric resin comprising a polyalkylene oxide homopolymer or a block random copolymer thereof having a molecular weight of between about 500 and 1,000,000; said resin being present in an amount insufficient to form an impermeable gel thereby preventing slurry felting.

4,578,151

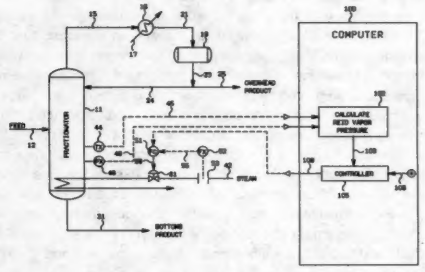
REID VAPOR PRESSURE DETERMINATION AND CONTROL IN FRACTIONAL DISTILLATION

Edwin D. Soderstrom, III, and Terrence A. Davis, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 23, 1982, Ser. No. 401,424

Int. Cl.[4] B01D *3/42*

U.S. Cl. 203—1 **6 Claims**



4. A method for controlling the Reid Vapor Pressure of the bottoms product stream withdrawn from a fractional distillation column to which a feed stream consisting essentially of a mixture of hydrocarbons selected from the same series is provided, said method comprising the steps of:

establishing a first signal representative of the temperature of said bottoms product stream;

establishing a second signal representative of the vapor pressure of said bottoms product stream;

establishing a third signal representative of the actual Reid Vapor Pressure of said bottoms product stream in response to said first and second signals, wherein an analysis of said bottoms product stream is not utilized to determine said Reid Vapor Pressure;

establishing a fourth signal representative of the desired Reid Vapor Pressure of said bottoms product stream;

comparing said third signal and said fourth signal and establishing a fifth signal which is responsive to the difference between said fourth signal and said fifth signal; and

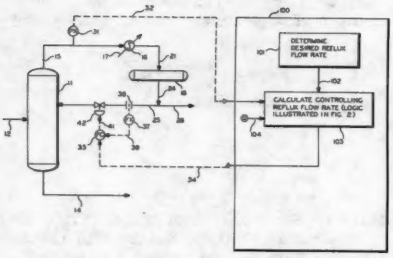
manipulating the rate at which heat is supplied to said fractional distillation column in response to said fifth signal to thereby maintain the actual Reid Vapor Pressure for said bottoms product stream substantially equal to the desired Reid Vapor Pressure represented by said fourth signal.

4,578,152

CONTROL OF A FRACTIONAL DISTILLATION PROCESS

Lloyd R. Albers, Angleton, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 1, 1985, Ser. No. 761,462
Int. Cl.[4] B01D 3/42
U.S. Cl. 203—1 4 Claims



3. A method for preventing the actual pressure in a fractional distillation column from exceeding a high limit for the pressure in said fractional distillation column, wherein said fractional distillation column is utilized to separate first and second components contained in a feed stream flowing to said fractional distillation column, wherein said first component is principally removed from said fractional distillation column as an overhead vapor stream, wherein said overhead vapor stream is at least partially condensed with a first portion of the condensate being returned to an upper portion of said fractional distillation column as an external reflux and a second portion of said condensate being removed from said fractional distillation process as an overhead product, and wherein said second component is principally removed from said fractional distillation column as a bottoms product, said method comprising the steps of:

establishing a first signal representative of the flow rate of said external reflux required to maintain a process variable at a desired value for a said process variable;

establishing a second signal representative of the actual pressure in said fractional distillation column means;

establishing a third signal representative of a high limit for the pressure in said fractional distillation column means;

comparing said second signal and said third signal and establishing a pressure compensating signal which is responsive to the difference between said second signal and said third signal, wherein said pressure compensating signal has a magnitude of zero if the magnitude of said second signal is not greater than the magnitude of said third signal and has a first magnitude with the dimension of flow rate if said second signal is greater than said third signal;

combining said first signal and said pressure compensating signal to establish a control signal; and

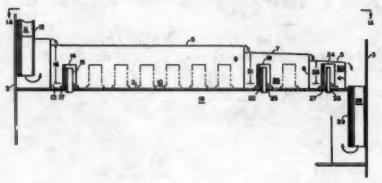
manipulating the flow rate of said external reflux in response to said control signal, wherein the first magnitude of said pressure compensating signal is such that combining said first signal and said pressure compensating signal results in a reduction in the flow rate of the external reflux required by said first signal if the actual pressure in said fractional distillation column means is greater than the high limit represented by said third signal.

4,578,153

SECTIONED BUBBLE TRAY DISTILLATION OVER A WIDE RANGE OF FEED COMPOSITION AND BUBBLE TRAY LOADING

Charles L. Newton, Bethlehem, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation of Ser. No. 215,490, Dec. 11, 1980, abandoned.
This application Jun. 7, 1982, Ser. No. 386,166
Int. Cl.[4] B01D 3/20
U.S. Cl. 203—99 3 Claims



1. In a distillation process for the separation of a volatile component from a less volatile component in a liquid multicomponent feed which comprises

charging said multicomponent feed to a distillation column having a plurality of bubble trays, said trays having a plurality of bubble apertures;

passing said multicomponent feed over said bubble trays whereby the feed is converted into a vapor fraction rich in a volatile component and a liquid fraction rich in less volatile component; and

removing said vapor fraction as overhead from the column and said liquid fraction as bottoms from the column;

the improvement for accommodating a liquid multicomponent feed having a variable, wide concentration range of volatile component to said less volatile component and accommodating varying rates of feed to the column without destroying bubble tray efficiency which comprises:

establishing a plurality of distinct separation zones on at least one bubble tray, said separation zones extending across said bubble tray and traversing a liquid path having a liquid gradient formed by the feed flowing from an inlet to an outlet across the tray, said separation zones including a plurality of bubble apertures;

maintaining a liquid head of substantially constant and uniform height, except for the difference associated with the liquid gradient, above said bubble apertures within each separation zone; and

maintaining in at least one of said separation zones a greater liquid head than that in another separation zone on said tray with the differential between the two liquid heads being greater than the liquid gradient across the separation zones.

4,578,154

METHOD AND APPARATUS FOR MEASURING DISSOLVED GAS CONCENTRATIONS

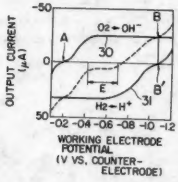
Masao Kitamura, Hitachiota; Norio Nakayama; Ryoei Katsura, both of Hitachi; Hidefumi Ibe, Katsuta, and Shunsuke Uchida, Hitachi, all of Japan, assignors to Hitachi, Ltd. and Hitachi Engineering Co., Ltd., both of Tokyo, Japan

Continuation-in-part of Ser. No. 592,801, Mar. 23, 1985, abandoned. This application Jun. 19, 1985, Ser. No. 746,010
Claims priority, application Japan, Mar. 25, 1983, 58-48646
Int. Cl.[4] G01N 27/54
U.S. Cl. 204—1 T 20 Claims

1. An apparatus for measuring dissolved oxygen and hydrogen gas concentrations which comprises:

an electrode;
a counter-electrode;
a vessel filled with electrolyte into which the electrodes are immersed;
an oxygen and hydrogen permeable membrane having a thickness in the range of 70 μm to 350 μm partitioning said electrolyte from sample water containing said dissolved gases outside of said vessel;
at least one power source applying a potential in the range of −0.4 to −0.75 V and connecting said electrode and said counter electrode;
means measuring current generated between said electrode and said counter electrode; and
wherein the thickness of the membrane determines a potential region for a reduction limiting current plateau and a potential region for an oxidation limiting current plateau between two dissolved gas components to be measured, the combination of both of said regions producing an overlapped potential region.

13. A method for measuring dissolved oxygen and hydrogen gas components comprising:
providing a sample water containing two dissolved gas components to be measured;



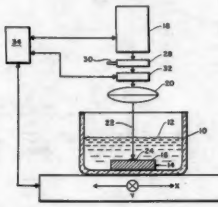
providing a membrane having a thickness in the range of 70 μm to 350 μm permeable by said dissolved gas components, the thickness of said membrane determining and a potential region for a reduction limiting current plateau and a potential region for an oxidation limiting current plateau between said two dissolved gases, the combination of both of said regions producing an overlapped potential region, said membrane separating a vessel from said sample water, said vessel being filled with electrolyte and containing an electrode and a counter-electrode immersed in said electrolyte and connected by a power source;
applying a first potential in the range of −0.4 to −0.75 V from said power source to produce said overlapped potential region and measuring a first current between the electrodes;
applying a second potential from said power source which is the oxidation-reduction equilibrium potential for one of the gases to be measured and measuring a second current between the electrodes to determine the concentration of said one of said gases; and
determining the concentration of the remaining one of said two dissolved gases by the difference between said first and second currents.

4,578,155
LASER INDUCED DEPOSITION ON POLYMERIC SUBSTRATES

Michael J. Halliwell, 4435 Willow Mist Dr., Dayton, Ohio 45424, and Joseph Zahavi, 9A Avigail St., Haifa, Israel

Filed Mar. 19, 1985, Ser. No. 713,660
Int. Cl.⁴ C25D *5/02*
U.S. Cl. 204—15 **9 Claims**

1. A method for selectively plating a metal onto a polymeric material which is normally solid at room temperature without application of an electrical potential source which comprises the steps of:
(a) contacting said polymer with an electroplating solution; and
(b) directing a focused laser beam having an intensity be-



tween about 0.05 joule/cm² and 5.0 joule/cm² and a focused spot diameter between about 0.25 and 2 mm through said solution onto said polymer to locally achieve plating thereon.

4,578,156
ELECTROLYTES FOR ELECTROCHEMICALLY TREATING METAL PLATES

Stephan J. W. Plazter, Calfon, N.J., assignor to American Hoechst Corporation, Somerville, N.J.

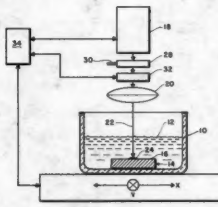
Filed Dec. 10, 1984, Ser. No. 680,029
Int. Cl.⁴ C25D *5/44*
U.S. Cl. 204—33 **39 Claims**

1. A process for preparing an element comprising cleaning a metal article, and then anodizing said metal article using direct current in an aqueous organic electrolytic solution having dissolved therein a water-soluble organic acid or mixture of two or more water-soluble organic acids which, if carboxylic be at least tribasic at a concentration of at least 0.05%, and a sufficient amount of a base to give said solution a pH in the range of from about 3 to about 10; under electrolytic conditions sufficient to form an insoluble metal oxide-organic complex, including said organic acid, bonded to the surface of said metal article.

4,578,157
LASER INDUCED DEPOSITION OF GAAS

Michael J. Halliwell, 4435 Willow Mist Dr., Dayton, Ohio 45424, and Joseph Zahavi, Technion Research & Development Foundation, Ltd., Israel Institute of Metals, Haifa, Technion City, Israel

Filed Oct. 2, 1984, Ser. No. 657,098
Int. Cl.⁴ C25D *5/02*
U.S. Cl. 204—15 **10 Claims**



1. A method for selectively plating a metal onto a gallium arsenide substrate without application of an electrical potential source which comprises the steps of:
(a) contacting said gallium arsenide with an electroplating solution; and
(b) directing a focused laser beam having an intensity between about 0.05 joule/cm² and 5.0 joule/cm² and a fo-

cused spot diameter between about 0.25 and 2 mm through said solution onto said gallium arsenide to locally achieve plating thereon.

4,578,158

PROCESS FOR ELECTROPLATING A METALLIC MATERIAL WITH AN IRON-ZINC ALLOY

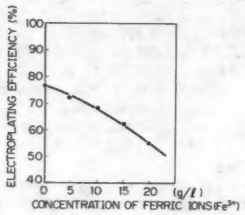
Tatsuya Kanamaru; Motohiro Nakayama; Yutaka Ogawa, and Katutoshi A. Arai, all of Tokai, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Oct. 30, 1984, Ser. No. 666,464

Claims priority, application Japan, Nov. 1, 1983, 58-203720; Jan. 23, 1984, 59-8522

Int. Cl.⁴ C25D 3/56

U.S. Cl. 204—44.2 **2 Claims**



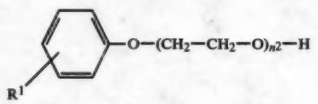
1. A process for electroplating a metallic material with an iron-zinc alloy, comprising electroplating a metallic material, by using an insoluble anode, in an electroplating sulfate liquid containing iron and zinc ions and 0.01 to 10 g/l of an additive consisting of at least one member selected from the group consisting of oxyalkylene compounds of the formulae (I) to (VIII):

$$H—O—(CH_2—CH_2—O)_n—H \quad (I)$$

wherein n represents an integer of 1 to 2000,

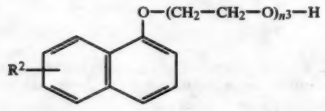
$$R—O—(CH_2—CH_2—O)_{n1}—H \quad (II)$$

wherein R represents an alkyl radical having 1 to 20 carbon atoms and n^1 represents an integer of 1 to 2000,



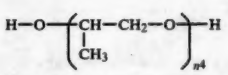
(III)

wherein R^1 represents a member selected from the group consisting of a hydrogen atom and alkyl radicals having 1 to 20 carbon atoms and n^2 represents an integer of 6 to 2000,



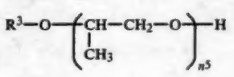
(IV)

wherein R^2 represents a member selected from the group consisting of a hydrogen atom and alkyl radicals having 1 to 20 carbon atoms and n^3 represents an integer of 4 to 2000,



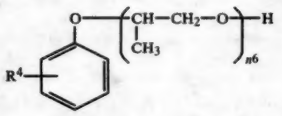
(V)

wherein n^4 represents an integer of 3 to 2000,



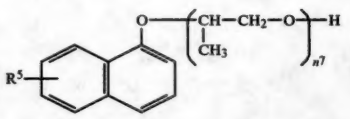
(VI)

wherein R^3 represents an alkyl radical having 1 to 20 carbon atoms and n^5 represents an integer of 1 to 2000,



(VII)

wherein R^4 represents a member selected from a group consisting of a hydrogen atom and alkyl radicals having 1 to 20 carbon atoms and n^6 represent an integer of 6 to 2000, and



(VIII)

whereim R_5 represents a member selected from the group consisting of a hydrogen atom and alkyl radical having 1 to 20 carbon atoms and n^7 represents an integer of 4 to 2000, and sulfation products of the above-mentioned oxyalkylene compounds.

4,578,159

ELECTROLYSIS OF ALKALI METAL CHLORIDE BRINE IN CATHOLYTELESS MEMBRANE CELLS EMPLOYING AN OXYGEN CONSUMING CATHODE

Ronald C. Miles; David D. Justice, both of Cleveland, Tenn., and Ronald L. Dotson, Cheshire, Conn., assignors to Olin Corporation, Cheshire, Conn.

Filed Apr. 25, 1985, Ser. No. 727,171

Int. Cl.⁴ C25B 1/16

U.S. Cl. 204—98 **11 Claims**

1. A process for electrolysis of an aqueous solution of an alkali metal halide in an electrolytic cell having an anode compartment containing at least one anode, a cathode compartment containing at least one cathode, and a cation exchange membrane separating said anode compartment from said cathode compartment, said process which comprises:

(a) feeding said aqueous solution of an alkali metal halide to said anode compartment;

(b) feeding an oxygen-containing gas to said cathode compartment;

(c) electrolyzing said alkali metal halide solution at a current density of at least about 2 kiloamperes per square meter to produce a halogen gas and alkali metal ions in said anode compartment;

(d) passing said alkali metal ions and water through said cation exchange membrane into said cathode compartment;

(e) contacting a hydrophilic porous cathode with said alkali metal ions, said water and said oxygen-containing gas to produce a concentrated alkali metal hydroxide solution,

said concentrated alkali metal hydroxide solution flowing through said hydrophilic porous cathode at a rate of from about 10 to about 20 milligrams per square meter per minute; and

(f) removing said concentrated alkali metal hydroxide solution from said cathode compartment to prevent a substantial accumulation of said concentrated alkali metal hydroxide solution in said cathode compartment.

4,578,160
METHOD FOR ELECTROLYZING DILUTE CAUSTIC ALKALI AQUEOUS SOLUTION BY PERIODICALLY REVERSING ELECTRODE POLARITIES

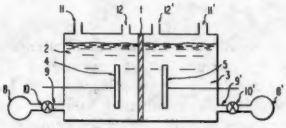
Hiroshi Asano, Kanagawa; Takayuki Shimamune, Tokyo, and Kazuhiro Hirao, Kanagawa, all of Japan, assignors to Permelec Electrode Ltd., Kanagawa, Japan

Filed Mar. 19, 1984, Ser. No. 590,668

Claims priority, application Japan, Mar. 18, 1983, 58-44076; Mar. 18, 1983, 58-44077

Int. Cl.⁴ C25B *1/46*

U.S. Cl. 204—98 **13 Claims**



6. A method for electrolyzing a dilute caustic alkali aqueous solution comprising:

(a) supplying dilute caustic alkali aqueous solution into one electrode compartment of an electrolytic cell partitioned by a cation exchange membrane;

(b) electrolyzing the solution therein; and

(c) recovering a concentrated caustic alkali aqueous solution from the other electrode compartment,

wherein iron, nickel or their base alloys is used as an electrode material, and electrolysis is conducted for a period of time substantially corresponding to the time required to obtain said concentrated caustic alkali aqueous solution, and then the direction of supplying and discharging the electrolyte is reversed and the direction of current flow is reversed after every said time period.

4,578,161
PROCESS FOR PREPARING QUATERNARY AMMONIUM HYDROXIDES BY ELECTROLYSIS

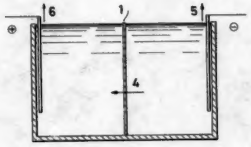
Franco Buonomo, Milan; Giuseppe Bellussi, Piacenza, and Bruno Notari, Milan, all of Italy, assignors to Enichimica S.p.A., Milan, Italy

Filed Mar. 14, 1984, Ser. No. 589,531

Claims priority, application Italy, Mar. 17, 1983, 20115 A/83

Int. Cl.⁴ C25B *1/00*

U.S. Cl. 204—102 **10 Claims**



1. In a process for preparing quaternary ammonium hydroxides by electrolysis in an electrolytic cell comprising an anode compartment, containing an anode, and a cathode compartment, containing a cathode, the improvement comprising providing a quantity of a quaternary ammonium halide to the cathode compartment and subjecting said halide to electrolysis, wherein the two compartments are separated by a semipermeable anion exchange membrane and the discharge of halogen at the anode is prevented by controlling the pH of the liquid in the anode compartment.

4,578,162
METHOD FOR DISSOLVING COPPER IN THE PRESENCE OF IRON

James A. McIntyre; Robert F. Phillips, and Max R. Oswald, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 29, 1984, Ser. No. 614,502

Int. Cl.⁴ C25C *1/12*

U.S. Cl. 204—107 **14 Claims**

1. A method for dissolving copper in the presence of iron comprising:

(a) contacting the copper with an oxidant solution containing a less-than-stoichiometric amount of oxidant necessary to dissolve all the copper;

(b) dissolving a portion of the copper into the solution;

(c) monitoring the copper ion concentration in the solution;

(d) controlling the copper ion concentration in the solution below that required to cause a runaway oxidant decomposition reaction;

(e) removing at least a portion of the dissolved copper from the solution;

(f) adding additional oxidant to the solution;

(g) at least repeating steps (a) and (b).

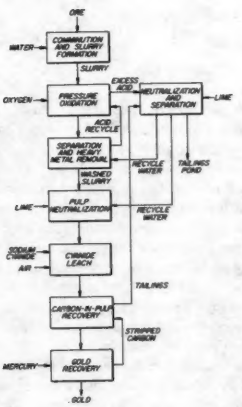
4,578,163
GOLD RECOVERY PROCESS

Richard S. Kunter, Lakewood, and John R. Turney, Arvada, both of Colo., assignors to Homestake Mining Company, San Francisco, Calif.

Filed Dec. 3, 1984, Ser. No. 677,455

Int. Cl.⁴ C25C *1/20*

U.S. Cl. 204—110 **22 Claims**



1. A process for recovering gold from an aqueous slurry formed from a refractory ore where said gold is subject to sulfide locking and adsorption on carbonaceous matter, said process comprising:

oxidizing the aqueous slurry in an autoclave under acidic conditions at an elevated temperature and pressure whereby elemental gold is released from the sulfide locking and carbonaceous adsorption and heavy metals present in the ore are solubilized;

separating the solubilized heavy metals from the oxidized aqueous slurry to form an acid liquid fraction containing the majority of the heavy metals and a solids fraction containing the gold ore;

recycling a portion of the acid liquid fraction to the autoclave to provide a source of acid for the oxidation;

disposing of the remaining portion of the liquid fraction to remove excess heavy metals and acid from the process;

dissolving the elemental gold in the solids fraction by exposure to cyanide to form a soluble gold-cyanide complex; and

recovering elemental gold from the gold-cyanide complex.

4,578,164

METHOD OF ELECTROLYTICALLY FINISHING SPRAY-HOLE OF FUEL INJECTION NOZZLE

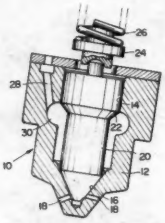
Yukio Matsui, Yokosuka, and Mitsuo Uchiyama, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Aug. 6, 1984, Ser. No. 637,728

Claims priority, application Japan, Aug. 24, 1983, 58-154719; Sep. 14, 1983, 58-141539[U]

Int. Cl.[4] B23H *9/02*

U.S. Cl. 204—129.55 **4 Claims**



1. A method of finishing at least one spray-hole bored by machining in a body of a fuel injection nozzle for an internal combustion engine by removing burrs that remain after the machining around an inside mouth of each spray-hole, the method having the step of subjecting an inner surface of the nozzle body in an area containing the inside mouth of each spray-hole to an electrolytic polishing treatment, wherein the nozzle body is made the anode, by inserting a tubular electrode having an insulator cover into the nozzle body such that an end portion of the electrode comes close to each spray-hole and supplying a pressurized electrolyte liquid into the interior of the nozzle body through the tubular electrode to flow out through each spray-hole,

characterized in that an portion of said insulator cover is so formed as to completely cover said end portion of said electrode and to have an outer surface which makes close contact with said area of the inner surface of the nozzlbe body, that for each spray-hole said insulator cover is formed with a liquid passage which communicates with the interior of said tubular electrode and has an outlet port in said outer spray-hole and is only slightly larger in diameter than the mouth of the spray-hole, and that during the electrolytic polishing treatment the electrolyte liquid supplied through said tubular electrode flows out of said insulator cover only through said passage formed for each spray-hole.

4,578,165

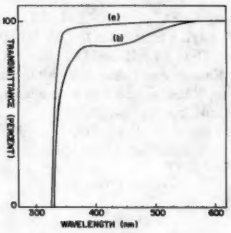
PROCESS FOR SEPARATION OF ZIRCONIUM FROM HAFNIUM

Steven H. Peterson, Murrysville, and John F. Jackovitz, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 21, 1983, Ser. No. 544,160

Int. Cl.[4] B01J *19/12*

U.S. Cl. 204—157.75 **22 Claims**



11. A process for the separation of zirconium and hafnium values from a mixture thereof comprising:

forming a solution of complexes of the hafnium and the zirconium, said complexes having a common organic ligand, one of said complexes being excitable by light within the wavelength range of 300–700 nm, while the other of said complexes is stable within said range;

irradiating said solution with light, having a wavelength within said range, in the presence of a scavenger, to excite said one complex and cause reaction thereof with the scavenger, and separation thereof from said solution, while the other complex remains in said solution;

and the excitable complex is said complex of hafnium and the stable complex is said complex of zirconium.

4,578,166

PROCESS OF ACTINIC IRRADIATION OF SHAPED POLYESTER IMIDE CONTAINING BENZOPHENONE TETRACARBOXYLIC DIIMIDE GROUP AND CROSS-LINKED PRODUCT

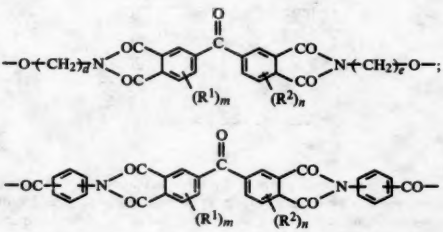
Keiichi Uno; Hikoichi Nagano, and Tadashi Ikegami, all of Otsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 126,167, Feb. 29, 1980, abandoned. This application Apr. 13, 1983, Ser. No. 484,459

Int. Cl.[4] C08J *7/10*; B32B *27/16*

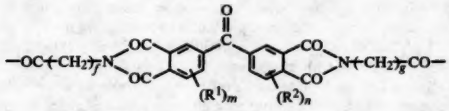
U.S. Cl. 8—115.52 **20 Claims**

1. A method for enhancing the physical and chemical properties of a shaped article of a polymeric composition, which comprises melt forming into a shaped article a polymer composition comprising as the essential component a saturated linear polyester comprising structural units from dicarboxylic acids, diols, lactones, oxycarboxylic acids, or functional derivations thereof and a structural unit selected from one of:



-continued

and



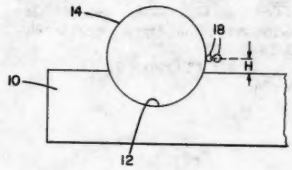
wherein R^1 and R^2 are the same or different and each represents a monovalent organic group, m and n are each an integer of 0 to 3, d and e are each an integer of 2 to 6, and f and g are each an integer of 1 to 6, in an amount of 0.01 to 50 moles per 100 moles of the total ester linkage in the molecule of the polyester and irradiating the shaped article with actinic radiation.

4,578,167

CELL FUSION

Wolfgang Schoner, Hanover, Fed. Rep. of Germany, assignor to Biofusion, Inc., Newton, Mass.

Filed Sep. 28, 1982, Ser. No. 426,114
Int. Cl.⁴ G01N *27/26, 27/28*
U.S. Cl. 204—183.1 **7 Claims**



1. The method of fusing cells, comprising the steps of

suspending the cells in a solution between two elongated electrodes providing an inhomogenous alternating electrical field,

allowing the cells to drift dielectrophoretically toward the electrodes and become attached thereto in strings or lines of two or more cells, and

applying a voltage pulse across the electrodes to cause strings of cells to fuse into single cells,

wherein the osmolarity of the actual sample of solution in which cells are to be suspended is measured and kept above 278 milliosmol/liter.

5. Apparatus for fusing cells, comprising

a pair of spaced-apart, elongated electrodes,

said electrodes forming between themselves an elongated fusion chamber for receiving a suspension of cells to be fused,

first electrical means for applying an alternating voltage across said electrodes,

said electrodes having a cross-sectional shape adapted to produce an inhomogenous electric field within said fusion chamber suitable for inducing dielectrophoretic movement of suspended cells towards the electrodes and for maintaining strings or lines of two or more cells in contact with said electrodes along an elongated, narrow attachment zone on each electrode,

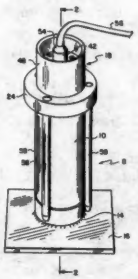
second electrical means for applying a voltage pulse across said electrodes after said cells have become attached thereto, the duration and amplitude of said pulse being sufficient to cause said strings of cells to fuse into a single cell, wherein the depth of said fusion chamber below the level of said attachment zones is less than 2 mils whereby it is shallow enough to inhibit collection of cells below said attachment zones, thereby improving fusion efficiency.

4,578,168

APPARATUS FOR FUSING LIVE CELLS WITH ELECTRIC FIELDS

Gunter A. Hofmann, San Diego, Calif., assignor to Biotronics, San Diego, Calif.

Filed Jul. 27, 1984, Ser. No. 635,009
Int. Cl.⁴ G01N *27/28*
U.S. Cl. 204—299 R **13 Claims**



1. An electro cell fusion apparatus comprising:

a metal vessel forming a first electrode and having an elongate cylindrical chamber formed therein and opening at an upper end of the vessel;

an elongate wire having a round cross-section forming a second electrode;

cap means connected to an end of the second electrode and configured to removably mate with the upper end of the vessel for positioning the second electrode so that it extends concentrically within the cylindrical chamber; and

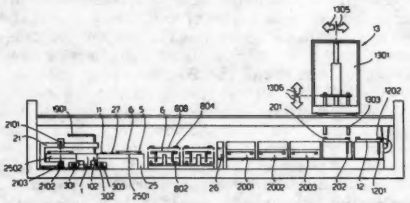
means for sequentially generating and applying predetermined alternating electric currents and unidirectional current pulses to the first and second electrodes so that when a plurality of live cells are supported in a quantity of fluid medium contained in the chamber the cells will undergo dielectrophoresis and dielectric breakdown thereby causing adjacent cells to fuse and produce viable hybrids.

4,578,169

APPARATUS FOR TOTAL AND FRACTIONAL ANALYSES OF PROTEINS

Guido F. Vicario; Cesare Vicario; Ugo de Luca, all of Milan, and Giuseppe Zelioli, Sant'Angelo Lodigiano, all of Italy, assignors to Elvi S.p.A., Milan, Italy

Filed Jun. 12, 1984, Ser. No. 620,083
Int. Cl.⁴ G01N *27/28*
U.S. Cl. 204—299 R **14 Claims**



1. In an automated electrophoresis apparatus for analysis of a protein-containing serum having assay means, at least one electrophoresis chamber, at least one support for electrophoresis, at least one strip of cellulose acetate, means for cutting and separating from said support said at least one strip, a first means for transferring said at least one strip between a storage posi-

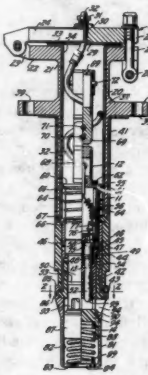
tion and a position in said chamber, and a subsequent cutting position, and serum depositing means for depositing serum in an intermediate position between said assay means and said electrophoresis chamber; the improvement comprising an electrophoresis chamber having at least one electrolytic bath and an electrophoresis support including at least one strip of cellulose acetate, said chamber further comprising two highly spongy fixed plates arranged in the electrolytic bath to emerge therefrom and a planar rigid electrophoresis support for bearing on the two spongy plates, said planar rigid support comprising a strip holder frame on two opposite sides of which said strip of cellulose acetate is secured.

4,578,170

MOUNTING STRUCTURE FOR ELECTRONIC PROBES

Michael Sheridan, Old Bridge, N.J., assignor to Ethylene Corp., Murray Hill, N.J.

Filed Apr. 5, 1985, Ser. No. 720,495
Int. Cl.[4] G01N *27/30*
U.S. Cl. 204—400 **1 Claim**



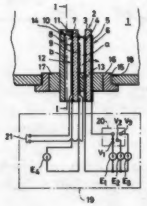
1. Improved mounting structure for positioning an electronic probe within a reactor vessel for determining on a substantially continuous basis quantitative values of a desired characteristic of a reaction, comprising: an elongated dip tube element mountable within an opening in said vessel adjacent an outer end thereof, said dip tube element having a centrally disposed bore terminating in an inner end forming a recess; said recess having engageable means; a removable probe carrying element having an outer configuration corresponding to the configuration of said bore in said dip tube element, and having corresponding engageable means on an outer surface thereof selectively cooperating with said engageable means of said dip tube element; said probe carrying element defining at least one cylindrical recess therein corresponding in configuration to the outer cylindrical configuration of an electronic probe; check valve means carried at an inner end of said dip tube element, operative upon disengagement of said probe carrying element therefrom to close said dip tube element against communication with the interior or said reactor vessel; and a means for maintaining said probe within said recess to position an operative end of said probe in exposed condition with said reactor vessel for contact with the contents thereof; said engageable means on said mounting element and said probe carrying element including interacting bayonet pins and grooves; said probe carrying element including a lower body member defining said recess, a probe retaining member overlying said recess, and threaded means retaining said retainer element in position upon said lower body member; a hollow cover member engaging an upper end of said lower body member, said cover member carrying said engageable means on said probe carrying element; said probe carrying element in engaged condition being disposed entirely within said dip tube element, and having a pivotally mounted tool-engaging extension on an outer end thereof to permit effective shortening of the length of said probe carrying element along the axis thereof during withdrawal; said last-mentioned engageable means including at least one laterally-extending pin, said cover member having an end plate thereon, said plate including a laterally-extending flange on the periphery thereof; and a coil spring positioned between said end plate and said pin, a lower end of which contacts a surface of said dip tube element upon engagement of said probe carrying element with said dip tube element to maintain said bayonet pin in engaged condition.

4,578,171

AIR/FUEL RATIO DETECTOR

Tetsusyo Yamada, and Shintaro Hirate, both of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd. and Mitsubishi Denki Kabushiki Kaisha, both of, Japan

Filed Dec. 13, 1984, Ser. No. 681,338
Claims priority, application Japan, Dec. 15, 1983, 58-237624; Dec. 15, 1983, 58-237625
Int. Cl.[4] G01N *27/58*
U.S. Cl. 204—406 **8 Claims**

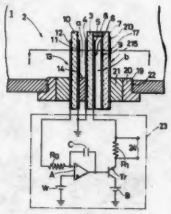


1. An A/F ratio detector comprising: a solid electrolyte oxygen pump element having porous electrodes formed on both sides of an oxygen-ion-conductive solid electrolyte and a solid-electrolyte oxygen-concentration-difference-actuated electrochemical cell sensor element disposed to face said pump element with a small gap therebetween and which has two pairs of porous electrodes formed on an oxygen-ion-conductive solid electrolyte with the electrodes of each pair being disposed on opposite sides of said electrolyte, said small gap communicating with ambient gases, means defining an air compartment open to the atmosphere on that side of at least said electrochemical cell sensor element of said two elements opposite said small gap, means for applying a first current between one of said electrodes of one of said two pairs and said electrodes of said pump element, said first current being of such direction that oxygen is supplied into said small gap, and means for applying a second current between one of said electrodes of said one of said two pairs and said electrodes of said pump element other than said electrodes to which said first current is applied, said second current being of such direction that oxygen is pumped out from said small gap, one of an electromotive force generated by the other pair of electrodes of said electrochemical cell sensor element, said second current and said first current providing an output signal for A/F ratio detection.

4,578,172
AIR/FUEL RATIO DETECTOR

Tetsuyo Yamada, and Shintaro Hirate, both of Aichi, Japan, assignors to NGK Spark Plug Co. and Mitsubishi Denki K.K., both of, Japan

Filed Dec. 13, 1984, Ser. No. 681,337
Claims priority, application Japan, Dec. 15, 1983, 58-237626; Aug. 17, 1984, 59-172114; Aug. 17, 1984, 59-172115
Int. Cl.[4] G01N *27/58*
U.S. Cl. 204—412 6 Claims

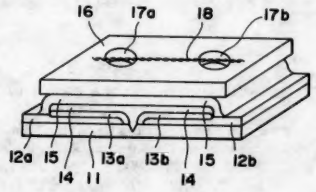


1. An air/fuel ratio detector comprising: a solid-electrolyte oxygen-concentration-difference-actuated electrochemical cell sensor element which has a porous electrode formed on both sides of an oxygen-ion-conductive solid electrolyte, a solid-electrolyte oxygen pump element which also has a porous electrode formed on both sides of an oxygen-ion-conductive solid electrolyte, and an oxygen reference element having a metal oxide semconductor layer formed on one side of a substrate which is made of an air-impermeable member, said electrochemical cell sensor element and said pump element being disposed to face each other with a small gap therebetween, an air compartment which is open to the atmosphere being formed between that side of said pump element which is opposite the side facing said small gap and that of said reference element which is opposite the side having said metal oxide semiconductor layer, the air/fuel ratio being detected both by a change in electrical properties as provided by said oxygen reference element and by an output signal as provided by at least one of the electromotive force of said electrochemical cell sensor element and a pump current flowing through said pump element.

4,578,173
ION SELECTIVE ELECTRODE AND METHOD OF MAKING ION SELECTIVE ELECTRODES

Osamu Seshimoto, and Mitsuharu Nirasawa, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 9, 1985, Ser. No. 732,368
Claims priority, application Japan, May 10, 1984, 59-93774; Jun. 20, 1984, 59-128239
Int. Cl.[4] G01N *27/30*
U.S. Cl. 204—416 10 Claims



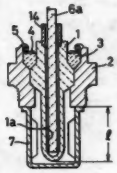
1. An integral ion selective electrode for analysis of a potassium ion comprising in order a support, an electroconductive metal layer, a layer of a water-insoluble salt of said metal, an electrolyte layer which comprises an electrolyte salt of a potassium ion with the same anion as the anion of the water-insoluble salt, said electrolyte layer being substantially free from a binder, and an ion selective layer, which is characterized in that the electrolyte layer comprises crystalline electrolyte having a mean crystal size of not more than 60 μm.

6. A process for the preparation of an integral ion selective electrode for analysis of a potassium ion comprising in order a support, an electroconductive metal layer, a layer of a water-insoluble salt of said metal, an electrolyte layer which comprises an electrolyte salt of a potassium ion with the same anion as the anion of the water-insoluble salt, and electrolyte layer being substantially free from a binder, and an ion selective layer, which is characterized in that the electrolyte layer is formed by coating an aqueous solution of said electrolyte salt on the layer of a water-insoluble salt and drying thus coated layer by bringing it in contact with a stream of gas maintained at a temperature of not lower than 40° C., thereby producing a layer of of crystalline electrolyte having a mean crystal size of not more than 60 μm over the layer of a water-insoluble salt.

4,578,174
OXYGEN SENSOR WITH HEATER

Nobuhide Kato, Ama, and Takao Murase, Konan, both of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Apr. 27, 1984, Ser. No. 604,973
Claims priority, application Japan, May 9, 1983, 58-68661[U]; May 9, 1983, 58-68662[U]; May 9, 1983, 58-68666[U]; May 9, 1983, 58-68667[U]
Int. Cl.[4] G01N *27/58*
U.S. Cl. 204—429 15 Claims



15. An oxygen sensor comprising:

a tubular solid electrolyte body having an elongate bore therein, a first end of said elongate bore is closed by one end of said tubular solid electrolyte body and a second end of said elongate bore is open at a second end of said tubular solid electrolyte body, said tubular body having reference and measuring electrodes on inner and outer surfaces thereof, respectively;

a housing body which supports said tubular solid electrolyte body such that said outer surface of said tubular body is exposed at said one end of said tubular body to an exhaust gas, said housing body maintaining said elongate bore in a gas-tight condition with respect to said exhaust gas and said one end of said tubular body extends outwardly from said housing body;

a protective cylindrical member enclosing said ene end of the tubular solid electrolyte body, said protective cylindrical member having at least one opening to permit said exhaust gas to be in contact with said one end of said tubular body; and

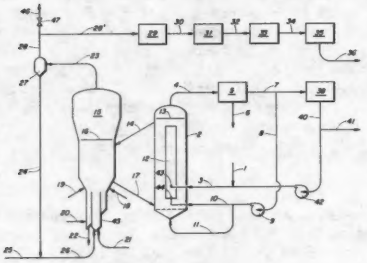
a bar-shaped heater inserted in said elongate bore of said tubular solid electrolyte body, and comprising a resistance heating portion having a positive temperature coefficient of resistance of not less than 0.3%/°C. and a ceramic body carrying said resistance heating portion, the resistance heating portion being located only in said one end of the tubular body and extending only within the protective cylindrical member enclosing said one end of said tubular solid electrolyte body.

4,578,175

COMBINED PROCESS FOR COAL PYROLYSIS AND CHAR GASIFICATION

Everett Gorin, San Rafael, Calif., assignor to Conoco Inc., Wilmington, Del.

Filed Apr. 2, 1984, Ser. No. 595,759
Int. Cl.[4] C10G *1/00*
U.S. Cl. 208—8 R 4 Claims



1. The method of converting coal to gaseous and liquid products which consisting essentially of:

(a) admixing finely divided coal into a hydrogencontaining recycle gas stream,

(b) providing a vertically elongated pyrolysis zone,

(c) introducing the coal-containing recycle gas stream of step (a) into a lower region of said pyrolysis zone,

(d) introducing a finely divided particulate heated char into a lower region of said pyrolysis zone,

(e) passing the resulting mixture of heated char, finely divided coal, and recycle gas upwardly through said pyrolysis zone at a temperature between about 500° and about 950° C. and a pressure between about 3 and about 33 atmospheres absolute,

(f) removing from an upper region of said pyrolysis zone a raw vapor stream comprising tar and lighter hydrocarbons,

(g) separating condensible liquid products from said raw vapor stream of step (f) to produce a gas stream,

(h) returning at least a portion of said gas stream from step (g) to comprise said recycle gas of step (a),

(i) removing from an upper region of said pyrolysis zone a stream of finely divided hot solids comprising char and ash,

(j) providing a vertically elongated fluidized bed gasification zone,

(k) passing said stream of hot solids from step (i) to an upper region of said gasification zone,

(l) directing oxygen-containing gas and steam into a lower region of said gasification zone in amount sufficient to maintain the solids therein in a state of fluidization,

(m) withdrawing from a lower region of said gasification zone a stream comprising coal ash,

(n) withdrawing from an intermediate region of said gasification zone a stream comprising heated char,

(o) passing the withdrawn char of step (n) to said step of introducing in step (d), and

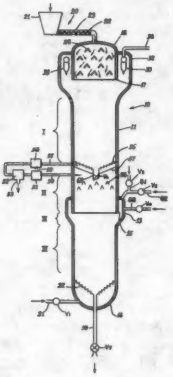
(p) withdrawing from an upper region of said gasification zone a synthesis gas product stream comprising carbon monoxide and hydrogen.

4,578,176

FUEL PRODUCTION BY FREE FALL COUNTERCURRENT FLOW

Paul B. Tarman, Elmhurst, Ill., assignor to Institute of Gas Technology, Chicago, Ill.

Continuation-in-part of Ser. No. 386,721, Jun. 9, 1982, Pat. No. 4,431,509. This application May 16, 1983, Ser. No. 493,135
The portion of the term of this patent subsequent to Feb. 14, 2001, has been disclaimed.
Int. Cl.[4] C10G *1/00, 1/02;* C10B *53/06;* C10J *3/46*
U.S. Cl. 208—8 R 18 Claims



1. In a process for production of liquid and gaseous fuels the steps comprising:

introducing solid organic carbonaceous particles of sizes about −10 to about +400 U.S. Sieve into the upper portion of a vertical reactor vessel;

introducing gas into the lower portion of said reactor vessel;

passing said carbonaceous particles of sufficiently high density within said particle sizes to free fall in a lean solids stream in countercurrent flow relation to said gas from said upper portion to said lower portion and passing said gas from said lower portion to said upper portion, said carbonaceous particles passing sequentially and said gas passing in reverse sequence through a solids preheat zone, a reaction zone, a heat addition zone, and a gas preheat zone, introducing gas to said reaction zone in an amount of about 5 to about 35 Standard Cubic Feet gas per pound of said carbonaceous particles, said gas moving upwardly at a higher flow rate than said solid particles and about 0.3 to about 15 feet per second providing solids residence time in said reaction zone of about 2 to about 400 seconds at reaction tempertures of about 800° to about 2000° F. forming predominantly said liquid and gaseous fuel products, the amount of heat added in said heat addition zone being sufficient to maintain said reaction temperatures in said reaction zone; and

removing said gas from the upper portion and spent carbonaceous particles from the lower portion of said reactor vessel.

4,578,177

METHOD FOR PRODUCING A PRECURSOR PITCH FOR CARBON FIBER

Kozo Yudate, and Ken Nagasawa, both of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Aug. 28, 1984, Ser. No. 645,175
Int. Cl.[4] C10C *3/02, 3/08;* D01F *9/14*
U.S. Cl. 208—45 3 Claims

1. A method for producing a precursor pitch for general purpose carbon fiber which comprises heating a coal tar pitch at a temperature of 350°–500° C. to form 10–30% by weight of

mesophase, extracting the thus heated pitch with an aromatic solvent to separate solvent insoluble matter including the mesophase, removing the solvent from the extract to obtain a pitch containing no free carbon, and extracting this pitch with a tar series light oil to obtain a precursor pitch having a softening point of higher than 200° C., a benzene insoluble portion of 45–60% by weight, a quinoline insoluble portion of less than 0.5% by weight and ash of less than 0.1% by weight.

4,578,178

METHOD FOR CONTROLLING FOULING DEPOSIT FORMATION IN A PETROLEUM HYDROCARBON OR PETROCHEMICAL

David R. Forester, The Woodlands, Tex., assignor to Betz Laboratories, Inc., Trevose, Pa.

Continuation-in-part of Ser. No. 543,576, Oct. 19, 1983, abandoned. This application May 4, 1984, Ser. No. 607,084

Int. Cl.⁴ C10G *9/12, 9/16*

U.S. Cl. 208—48 AA **8 Claims**

1. A method of inhibiting fouling deposit formation in a petroleum hydrocarbon during processing thereof at temperatures between about 600° F. and about 1000° F. wherein, in the absence of antifouling treatment, fouling deposits are normally formed as a separate phase within said petroleum hydrocarbon impeding process throughput and thermal transfer and thus deleteriously affecting the yield of finished product, said method comprising adding to said petroleum hydrocarbon an antifouling amount of an antifouling compound selected from the group consisting of C_1–C_5 alkyl alcohol esters and polyglycol esters of polyisobutenylthiophosphonic acid.

4,578,179

HYDROFINING PROCESS FOR HYDROCARBON CONTAINING FEED STREAMS

Simon G. Kukes; Marvin M. Johnson; Daniel J. Strope, and Robert J. Hogan, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 18, 1983, Ser. No. 553,445

Int. Cl.⁴ C10G *45/04, 45/08, 47/06, 47/12*

U.S. Cl. 208—110 **19 Claims**

1. A process for hydrofining a hydrocarbon-containing feed stream which contains metals comprising the steps of:

introducing a treated, decomposable molybdenum compound into said hydrocarbon-containing feed stream, wherein said treated, decomposable molybdenum compound is prepared by reducing the valence state of a decomposable compound of molybdenum and wherein the molybdenum in said decomposable compound of molybdenum is in a valence state of +1 to +6 prior to reduction; and

contacting said hydrocarbon-containing feed stream containing said treated, decomposable compound of molybdenum under hydrofining conditions with hydrogen and a catalyst composition comprising a support selected from the group consisting of alumina, silica and silica alumina and a promoter comprising at least one metal selected from Group VIB, Group VIIB and Group VIII of the Periodic Table.

4,578,180

HYDROFINING PROCESS FOR HYDROCARBON CONTAINING FEED STREAMS

Simon G. Kukes; Robert J. Hogan; Daniel M. Coombs, and Daniel J. Strope, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 5, 1984, Ser. No. 596,983

Int. Cl.⁴ C10G *45/12, 47/12, 47/16*

U.S. Cl. 208—110 **22 Claims**

1. A process for hydrofining a hydrocarbon-containing feed stream which contains metals comprising the steps of:

introducing a decomposable compound selected from the group consisting of dimanganese decacarbonyl and chromium hexacarbonyl into sand hydrocarbon-containing feed stream, wherein a sufficient quantity of said decomposable compound is added to said hydrocarbon-containing feed stream to result in a concentration of manganese and/or chromium in said hydrocarbon-containing feed stream in the range of about 1 to about 60 ppm; and

contacting said hydrocarbon-containing feed stream containing said decomposable compound under hydrofining conditions with hydrogen and a catalyst composition comprising a support selected from the group consisting of alumina, silica and silica-alumina and a promoter comprising at least one metal selected from Group VIB, Group VIIB and Group VIII of the Periodic Table.

4,578,181

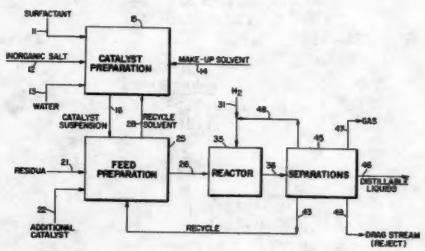
HYDROTHERMAL CONVERSION OF HEAVY OILS AND RESIDUA WITH HIGHLY DISPERSED CATALYSTS

Eric G. Derouane, Hopewell, N.J., and Philip Varghese, Newtown, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 25, 1984, Ser. No. 624,304

Int. Cl.⁴ C10G *47/06, 47/12, 47/20, 11/06*

U.S. Cl. 208—110 **23 Claims**



1. A process for catalytically converting a heavy hydrocarbon feedstock to lower boiling liquids, comprising:

preparing a colloidal dispersion of a metal catalyst in a mixed water-organic liquid phase by admixing an effective amount of an aqueous salt solution of a metal with an inverse micellar dispersion of said mixed water-organic liquid phase and reducing or precipitating said metal salt to an elemental metal or metal compound; and

contacting said feedstock with said colloidal dispersion in the presence of hydrogen and at a temperature necessary to effect said catalytic conversion.

4,578,182

CATALYSTS AND HYDROCONVERSION PROCESSES UTILIZING THE SAME

Roby Bearden, Jr., and Clyde L. Aldridge, both of Baton Rouge, La., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Division of Ser. No. 728,082, Apr. 29, 1985, abandoned. This application Aug. 5, 1985, Ser. No. 762,276

Int. Cl.⁴ C10G *13/06*

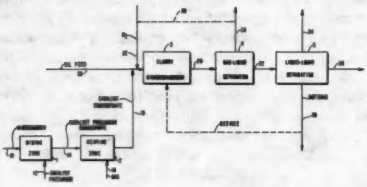
U.S. Cl. 208—112 **9 Claims**

1. A process for hydroconverting a carbonaceous chargestock to produce a hydroconverted, hydrocarbonaceous oil product which comprises: reacting said carbonaceous chargestock with hydrogen in the presence of a catalyst at hydroconversion conditions, said catalyst having been prepared by the steps which comprise:

(a) forming a mixture of a hydrocarbon material and the reaction product of CrO_3 and tert-butyl alcohol, said reaction product having been obtained by reacting tert-butyl alcohol with CrO_3 at ambient temperature, and

(b) heating the resulting mixture in the presence of a hydrogen sulfide-containing gas at conditions, including a tem-

perature of at least about 500° F. and a total pressure ranging from about 50 to 5000 psig, to produce a slurry



comprising said hydrocarbon material and a solid chromium-containing catalyst.

4,578,183

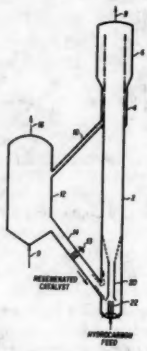
FEED MIXING TECHNIQUE FOR FLUIDIZED CATALYTIC CRACKING OF HYDROCARBON OIL

Tai-Sheng Chou, and Chang-Kuei Lee, both of Sewell, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 30, 1984, Ser. No. 676,967

Int. Cl.⁴ C10G *35/14*

U.S. Cl. 208—113 **8 Claims**



1. In a fluid catalytic cracking process comprising admixing a hydrocarbon oil feed with hot regenerated catalyst in the bottom section of a reactor riser, passing the mixture of the hydrocarbon oil feed and the catalyst through the riser, thereby at least partially volatilizing the oil feed and effecting cracking thereof at process temperature under endothermic process conditions and deactivating the catalyst by deposition of carbonaceous deposits thereon, separating the deactivated catalyst from the cracked hydrocarbonaceous feed, passing the deactivated catalyst to a regenerator vessel wherein the carbonaceous deposits are removed from the deactivated catalyst under oxidizing conditions by means of a regenerating medium introduced into the regenerator vessel, and passing the regenerated hot catalyst through a regenerated catalyst return conduit substantially above process cracking temperature to the bottom section of the reactor riser; the improvement comprising

injecting oil feed into a primary mixing zone in a draft tube mixer, which comprises a substantially tubular member extending lengthwise in the riser reactor from a point below said regenerating catalyst return conduit to a point above said conduit and terminating in an upper outwardly flared discharge end substantially extending to said reactor riser wall, and said draft tube mixer containing apertures in the portion of said mixer extending above said catalyst return conduit;

continuously passing a first portion of the hot regenerated catalyst into the draft tube mixer sufficient to vaporize a major amount of oil feed without substantial cracking thereof; and

passing a remaining second hot regenerated catalyst portion into the reactor riser through a passage between the draft tube mixer and reactor riser wall and thereafter through said apertures, thereby mixing additional hot catalyst with vaporized oil feed to crack the oil feed in the draft tube mixer and in the remaining portion of the riser.

4,578,184

PROCESS FOR NON-DESTRUCTIVE SEPARATION OF MIXTURES CONTAINING PLASTICS SCRAP

Erik Rasmussen, Klampenborg, Denmark, assignor to Aktieselskabet Nordiske Kabel-OG Traadfabriker, Copenhagen, Denmark

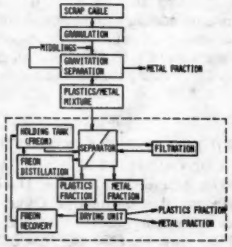
PCT No. PCT/DK82/00114, § 371 Date Aug. 16, 1983, § 102(e) Date Aug. 16, 1983, PCT Pub. No. WO83/02281, PCT Pub. Date Jul. 7, 1983

PCT Filed Dec. 23, 1982, Ser. No. 530,578

Claims priority, application Denmark, Dec. 23, 1981, 5736-81

Int. Cl.⁴ B03B *5/28*

U.S. Cl. 209—3 **11 Claims**



1. A process for non-destructive separation of mixtures containing plastics scrap and scrap metals or glass or mixtures thereof which comprises separation of a mixture of finely divided plastic and metal or glass scrap materials or mixtures thereof in a sedimented and a non-sedimented fraction by means of a liquid separating medium containing a halogenated hydrocarbon by adding the mixture of finely divided scrap material to a liquid halogenated hydrocarbon which is substantially chemically inert towards the components of the mixture and has essentially no swelling or dissolving effect on the plastics components and which has an intermediate density in relation to the densities of the plastics and metal or glass components and separating the resulting non-sedimented plastics and sedimented metal or glass said liquid separating medium requiring no further pre-conditioning and no mercuric chloride.

4,578,185

WASTE DISPOSAL SYSTEM

Joseph H. Wilson, Indianapolis; Jeffrey C. Rapp, Greenwood; Brian K. Southern, Zionsville, and Martin E. Elliott, Indianapolis, all of Ind., assignors to Medical Safetec, Inc., Indianapolis, Ind.

Filed Jul. 24, 1985, Ser. No. 758,439

Int. Cl.⁴ B01D *36/00*

U.S. Cl. 210—85 **37 Claims**

1. A waste disposal system for treating and disposing of infectious waste articles in a substantially controlled closed aseptic environment and for converting said infectious waste articles into a safely disposable noninfectious and nontoxic residue through the thorough disintegration and disinfection of such articles, said system comprising:

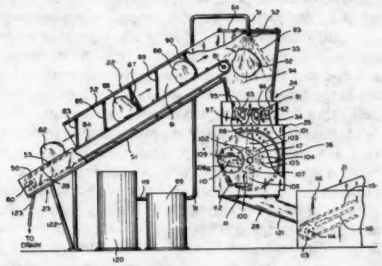
system input means into which accumulated quantities of said waste articles are initially placed for subsequent treatment and disposal of same;

waste delivery means operably connected to said waste input means at a first delivery end for transferring said accumulated quantities of said waste articles to a second delivery end, said second delivery end being positioned substantially opposite said first delivery end;

preliminary waste processing means operably positioned proximate to the second delivery end of said waste delivery means for preliminarily restructuring said waste articles into substantially small waste fragments for further treatment and disposal of same by said waste disposal system;

disinfectant spray means operably positioned adjacent one or more of said second delivery end of said waste delivery means and said preliminary waste processing means for enveloping and impregnating one or more of said waste articles and said waste fragments in a bacteria killing disinfecting liquid solution through the spray emitted by said spray means and the operation of said preliminary waste processing means;

said disinfecting liquid solution and waste fragments being jointly directed from said preliminary waste processing means by fragment-solution channeling means having a first and second end with said first end being operably positioned adjacent said preliminary waste processing means,



rotary hammermill means operably attached to the second end of said fragment-solution channeling means for receiving said waste fragment-disinfectant solution from said fragment solution channeling means, and for violently disintegrating same at a substantially high speed, into a waste particle-disinfectant solution,

said rotary hammermill means being powered by hammermill motor means operably coupled thereto;

hammermill solution transmission means having a first and second end through which said waste particle-disinfectant solution is routed out of said rotary hammermill for further treatment and disposal by said waste disposal system;

liquid-solid particle separation means operably attached to the second end of said hammermill transmission means for separating, on a continuous basis, said disintegrated particles of solid waste from said enveloping and impregnating disinfectant liquid;

said liquid-solid particle separation means including operable connections to liquid evacuation means and solid particle evacuation means for disposal of said disinfectant liquid and said solid waste particles respectively;

system vacuum ventilation means operably associated with said disposal system for effectively precluding the inadvertent release of bacteria and other contamination during the treatment and disposal of said waste articles by said system; and

system switching control means operably associated with one or more of said waste input means, waste delivery means, preliminary waste processing means, disinfectant spray means, rotary hammermill means, liquid-solid particle separation means and system vacuum ventilation means for controlling the activation and sequencing of one or more of same relative to one or more of the others.

4,578,186

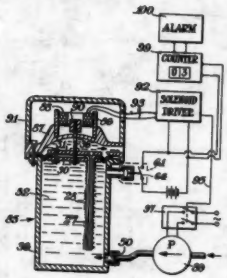
SWIMMING POOL FILTER SYSTEM

Thomas M. Morin, West Mountain Rd., Adams, Mass. 01220

Filed Sep. 4, 1984, Ser. No. 646,835

Int. Cl.[4] B01D *35/02, 35/14*

U.S. Cl. 210—90 **5 Claims**



1. A swimming pool filter system comprising:

(a) a water pump;

(b) a water filter of the diatomaceous earth type comprised of a housing, an inlet water chamber having means defining an inlet port and an outlet water chamber enclosed by said housing, and a movable water-permeable wall means separating said inlet and outlet chambers for supporting on the inlet chamber side of said wall a coating of diatomaceous earth and for moving, relative to said housing, in response to being mechanically energized to regenerate said filter;

(c) a first water-conduit means for hydraulically series connecting said pump and said filter in a hydraulic loop with a swimming pool;

(d) an electrically actuable alarm;

(e) a pressure-actuated switch means hydraulically connected to said inlet port of said filter for closing or opening an electrical circuit each time the pressure at said filter inlet port rises to a predetermined value; and

(f) a resettable counter means for counting the number of times said electrical circuit is closed or opened and thus the number of times said filter was regenerated, and for actuating said alarm when the count reaches a predetermined number of filter regenerations.

4,578,187

ION EXCHANGE APPARATUS TO IMPROVE THE QUALITY OF POTABLE WATER

Erich Alhäuser, Am Hözebert 2, 5412 Ransbach-Baumbach, Fed. Rep. of Germany

Filed Jun. 29, 1984, Ser. No. 625,959

Int. Cl.[4] C02F *1/42*

U.S. Cl. 210—93 **15 Claims**

1. Apparatus for the improvemnt of the quality of potable water, with a housing, in which is received a replaceable cartridge, an ion exchange and a bacteriostatically effective material, characterized by the combination of the following features:

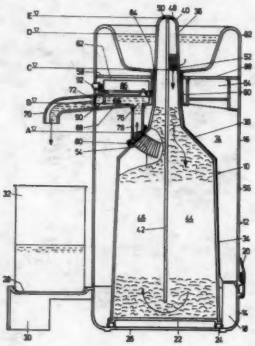
(a) the cartridge (10) is formed as an essentially closed upright container and is divided by a partition wall (42) ending at some distance above the container bottom (22) into a first chamber (44) provided with an inlet from which the flow is downward in the said first chamber (44)

and a second chamber (46) through which the flow is upward and leading to a discharge opening (54),

(b) the inlet opening (52) of the cartridge (10) is substantially higher than discharge opening (54),

(c) the inlet opening (52) and discharge opening (54) of the cartridge (10) are provided with particle filters,

(d) at least the second chamber (46) of the cartridge (10) is extended upward beyond the level of inlet opening (52) outward and upward and is ventilated at the top end through ventilation slots (48,50),



(e) a filling funnel (82) is arranged to be tightly attached at the inlet opening (52) of the cartridge (10), the top edge of said opening being substantially lower than the ventilation slots (48, 50), and

(f) a vertical pipe (78) is arranged on the inside of the housing to be sealingly attached at the discharge opening (54) of the cartridge (10), the said vertical pipe (78) opening with its top end below the inlet opening (52) into a discharge passage (66) configured with inclination to its free end.

4,578,188

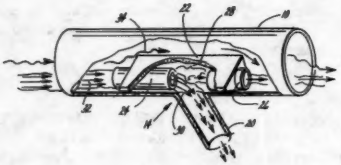
SEWERAGE FLOW DIVERTER

Kenneth P. Cousino, 2860 Grant, Ann Arbor, Mich. 48104

Filed Jul. 26, 1985, Ser. No. 759,595

Int. Cl.[4] E03F *3/04*

U.S. Cl. 210—170 **8 Claims**



1. A sewage flow diverter comprising a relatively large drain, a weir in the bottom of the drain, an inlet communicating with the drain adjacent the bottom thereof, and upstream of the weir, an outlet communicating with the drain downstream from the weir, the opposite ends of the inelt and outlet being adjacent,

opening means located between the opposite ends of the inlet and outlet, said opening means so located and sized to permit relatively low flows of liquid in the inlet to pass through the opening and relatively high flows to be propelled by the kinetic energy of the flow from the inlet into the outlet, and means to conduct the flow passing through the opening means to a sanitary interceptor.

4,578,189

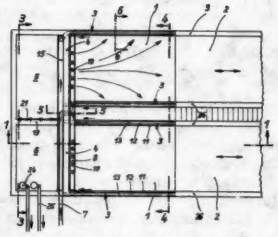
SLUDGE SETTLING PLANT

Rudolf Riker, Memmingen, Fed. Rep. of Germany, assignor to Stetter GmbH, Memmingen, Fed. Rep. of Germany

Filed Aug. 24, 1984, Ser. No. 644,041

Int. Cl.[4] C02F *11/00*

U.S. Cl. 210—253 **8 Claims**



1. In a sludge settling plant comprising at least two juxtaposed settling tanks defined by a pair of longitudinal outer walls, at least one longitudinal inner wall, a continuous cross wall and opposite end walls; at least one collecting tank defined by a pair of longitudinal walls, said continuous cross wall and an end wall; flow channels connecting said settling tanks with said collecting tank respectively; overflow weirs arranged in a flow path between each one of the settling tanks and the collecting tank, an inlet duct extending crosswise between said pair of longitudinal outer walls of the settling tanks at one end thereof and connecting said settling tanks in parallel in the flow path, and discharge means connected with said collecting tank; the improvement comprising:

at least one valve to stop the supply of sludge to one of said two settling tanks while maintaining the supply to the other one of the two settling tanks, the inlet duct arranged at said cross wall between said two settling tanks and said collecting tank, the end walls of the settling tanks formed as inclined ramps trafficable by an excavator; said overflow weirs and said flow channels extending longitudinally along at least one of the outer and inner longitudinal walls of the settling tanks respectively; said flow channels being formed as troughs and being inclined downwardly toward the cross wall and passing through said cross wall.

4,578,190

FLUID DISTRIBUTION SYSTEM FOR SEPARATION MODULES

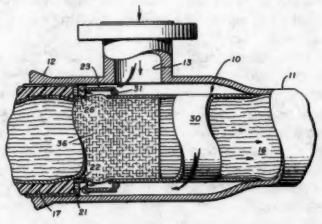
James D. Fowler, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Oct. 26, 1984, Ser. No. 665,411

The portion of the term of this patent subsequent to Jan. 21, 2003, has been disclaimed.

Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—321.1 **6 Claims**



1. A fluid distribution system for a fluid separation module

having a bundle of hollow fiber membranes positioned in a cylindrical shell and extending through a tube sheet positioned in an enlarged end portion of the shell, the enlarged end portion of the shell having therein an inlet opening for the admission of a fluid mixture into the shell, comprising

(a) a first sleeve attached to the tube sheet in a position enclosing the bundle of fibers, said first sleeve having a distal end spaced from the tube sheet,

(b) a second sleeve positioned to enclose the fiber bundle, said second sleeve being spaced from the tube sheet to leave a first annular opening for the passage of the fluid mixture in a radial direction toward the first sleeve, said second sleeve surrounding the distal end of the first sleeve and having a diameter greater than the diameter of the first sleeve to provide a second annular opening for flow of the fluid mixture in an axial direction therebetween,

(c) means securing the first and second sleeves together at spaced points therearound to hold the second sleeve in a position concentric with the first sleeve,

(d) a third sleeve having a diameter substantially equal to the diameter of the first sleeve and being spaced from the first sleeve to provide a third annular opening therebetween,

(e) means for securing the second sleeve to the third sleeve, and

(f) a fourth sleeve in the form of a porous fabric, said sleeve extending from the first sleeve to the third sleeve to cover the third annular opening, said fourth sleeve having a diameter less than the diameter of the second sleeve to hold the hollow fiber membranes out of contact with said second sleeve.

4,578,191

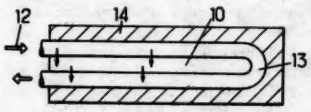
BIO-ARTIFICIAL ULTRAFILTRATION PANCREAS

Michel Jaffrin, Compiegne, and Gerard Reach, Paris, both of France, assignors to Centre National de la Recherche Scientifique, Paris, France

Filed Aug. 1, 1983, Ser. No. 519,315

Claims priority, application France, Aug. 9, 1982, 82 13869

Int. Cl.⁴ B01D *13/00*

U.S. Cl. 210—323.2 **10 Claims**

1. A bio-artificial pancreas comprising:

two ultrafiltration membranes having approximately parallel substantially planar confronting surfaces spaced apart a distance such that the space there between defines a volume of small thickness;

islets of Langerhans contained in said compartment;

means defining a blood path whereby blood flowing along said blood path successively sweeps said surfaces of said two membranes opposite said volume occupied by said islets of Langerhans over a length greater by at least one order of magnitude than the distance which separates said membranes;

said membranes being constructed and arranged such that said volume fulfills the condition;

$$V_i \geq (S)(P_M)(\tau)(\Delta P/8)$$

in which

V_i = said volume,

S = total membrane area,

P_M = hydraulic permeability of membrane,

τ = acceptable time constant, and

ΔP = available drive pressure.

4,578,192

FILTER CLOTH FOR A DISK FILTER

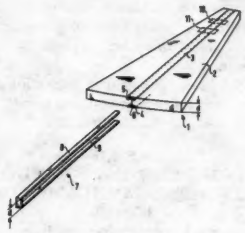
Hans-Rudolf Müller, Ostbühlstr. 49, CH-8038 Zürich, Switzerland

Filed Aug. 10, 1984, Ser. No. 639,404

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1983, 3329117

Int. Cl.⁴ B01D *25/02*

U.S. Cl. 210—486 **11 Claims**



1. A device for use with a disk filter cell, said device comprising:

filter cloth means for use with a sector-shaped disk filter cell; and

reinforcement means directly integrated into said filter cloth means, said reinforcement means being U-shaped clamps made from metal, plastic, or some other rigid material, and a leg spacing of said U-shaped clamps being adapted to the sector-shaped disk filter cell thickness.

4,578,193

CHROMATOGRAPHY COLUMNS

David Shepherd, Cheshire, England, assignor to Imperial Chemical Industries PLC, London, England

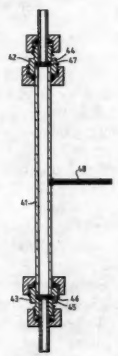
Division of Ser. No. 524,073, Aug. 17, 1983. This application Nov. 23, 1984, Ser. No. 673,849

Claims priority, application United Kingdom, Sep. 6, 1982, 8225308

The portion of the term of this patent subsequent to Feb. 5, 2002, has been disclaimed.

Int. Cl.⁴ B01D *15/08*

U.S. Cl. 210—656 **16 Claims**



1. A method for packing a chromatography column having an inlet port at one end and an outlet port at the other end, said method comprising the steps of:

(a) forming particulate material into a bed between porous bed-retaining means located to protect the inlet and outlet

ports by feeding a slurry or smoke of particulate bed material in a carrier fluid into the column;

(b) applying a predetermined pressure to the bed of particulate material while allowing the carrier fluid to escape;

(c) thereafter feeding at least a final portion of the slurry or smoke of particulate material through a filler tube in communication with the space in the column until the space is full;

(d) continuing to feed the at least final portion of the slurry or smoke of particulate material until the particulate material bed extends back into the filler tube;

(e) maintaining the predetermined pressure applied to the bed via the slurry or smoke of particulate material in the filler tube; and

(f) sealing the filler tube against relaxation of the pressure applied to the bed of particulate material.

4,578,194

PROCESS FOR REMOVING POLYCHLORINATED BIPHENYLS FROM TRANSFORMER-INSULATING LIQUIDS

Dieter Reinartz, St. Augustin; Heinrich Bender, Troisdorf, and Günter Laurent, Bad Honnef, all of Fed. Rep. of Germany, assignors to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany

Filed Jan. 18, 1985, Ser. No. 692,624

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1984, 3401866

Int. Cl.[4] B01D *15/00*

U.S. Cl. 210—673 **17 Claims**

1. A process for removing polychlorinated biphenyls from a transformer-insulating liquid containing said polychlorinated biphenyls, which comprises:

substantially continuously circulating said liquid through a circuit comprising an adsorption resin which is capable of adsorbing said polychlorinated biphenyls, to adsorb said polychlorinated biphenyls on said resin;

washing said resin having said polychlorinated biphenyls adsorbed thereon with a solvent for said polychlorinated biphenyls to dissolve said polychlorinated biphenyls in said solvent and thus remove said polychlorinated biphenyls from said resin; and

passing a gas through the solvent-treated resin to entrain residual solvent in said gas and thus remove said residual solvent from said resin, thereby regenerating said resin.

4,578,195

PROCESS FOR THE PURIFICATION OF EFFLUENTS AND PURGE STREAMS CONTAINING TRACE ELEMENTS

Sanders H. Moore; Maurice R. Smith, both of Cleveland, and Harvey B. Cochran, Englewood, all of Tenn., assignors to Olin Corporation, Cheshire, Conn.

Continuation-in-part of Ser. No. 426,340, Sep. 29, 1982, abandoned. This application Jul. 26, 1984, Ser. No. 634,837

Int. Cl.[4] C02F *1/28*

U.S. Cl. 210—679 **23 Claims**

1. A process for purifying an aqueous effluent containing at least one polluting element dissolved therein which comprises:

(a) contacting said aqueous effluent with a poly(dithiocarbamate) chelating resin having a sulfur content of from about 6 to about 7 percent whereby the polluting elements are absorbed to form a contaminated poly(dithiocarbamate) chelating resin;

(b) extracting said contaminated poly(dithiocarbamate) chelating resin with an acidic aqueous solution having a pH of from about 4 to about 6;

(c) recovering said contaminated poly(dithiocarbamate) resin; and

(d) depositing said contaminated poly(dithiocarbamate) chelating resin in an unsecured landfill area.

4,578,196

METHOD AND SYSTEM FOR FILTERING COOKING OIL

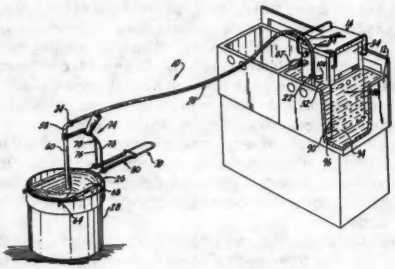
Bernard Friedman, Allentown, Pa., assignor to Oil Process Systems, Inc., Allentown, Pa.

Continuation of Ser. No. 304,653, Sep. 23, 1981, Pat. No. 4,462,915. This application Jul. 27, 1984, Ser. No. 635,302

The portion of the term of this patent subsequent to Jul. 31, 2001, has been disclaimed.

Int. Cl.[4] B01D *29/32*

U.S. Cl. 210—765 **25 Claims**



1. A method of filtering cooking oil in a cooking vessel, comprising the steps of:

providing a collection vessel, a filter member, and a centrifugal pump apparatus, said centrifugal pump apparatus including an impeller, an impeller discharge, a flexible conduit having an inlet end coupled in fluid communication with said impeller discharge and an outlet end, and a housing having a hollow interior in which said impeller is located, and housing being of a size and configuration for supporting said centrifugal pump apparatus in free-standing relationship on a base of a vessel;

supporting said filter member in relation to said collection vessel so as to be in position to receive oil to be filtered and to discharge filtered oil into said collection vessel after it has been filtered by said filter member;

placing said centrifugal pump apparatus directly in said cooking vessel so that said housing is supported on the base of said cooking vessel and so that at least said impeller is in direct contact with said oil to be filtered in said cooking vessel;

arranging said outlet end of said flexible conduit so as to be in position to discharge oil into said filter member; and

operating said centrifugal pump apparatus to rotate said impeller to pump said oil from said cooking vessel through said flexible conduit into said filter member.

4,578,197

METHOD OF AND FILTER THICKENER FOR THICKENING OF SUSPENSIONS

Hans Müller, Erlenbach, Switzerland, assignor to DrM Dr. Müller AG, Männedorf, Switzerland

Filed Jul. 23, 1982, Ser. No. 401,322

Claims priority, application Switzerland, Aug. 4, 1981, 5015/81; Oct. 5, 1981, 6375/81

The portion of the term of this patent subsequent to Mar. 27, 2001, has been disclaimed.

Int. Cl.[4] B01D *35/12*

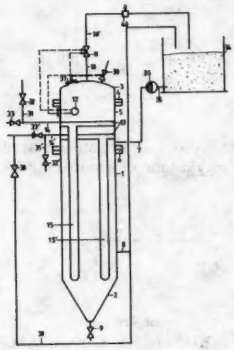
U.S. Cl. 210—772 **32 Claims**

1. A method of continuously thickening of suspensions in a filter thickener having a plurality of candle-like filter elements arranged in a container on individual collecting pipes, comprising the steps of

thickening a suspension by filtering the same through filter

elements in a filtration direction and withdrawing a thickened matter;

backwashing the filter elements without individually interrupting the filtration and by applying to the filter elements pressure impulses of gaseous backwash medium in a direction which is opposite to the filtration direction;



forming over the filter elements by the gaseous backwash medium a gas chamber separated from a suspension fluid and having an adjustable pressure; and

adjusting a gas pressure in the gas chamber so as to maintain a constant level of fluid in the container.

4,578,198

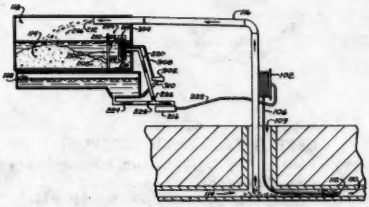
SEWER AND CATCH BASIN CLEANING SYSTEM

Ronald L. Schmidt, and Roland E. Shaddock, both of Streator, Ill., assignors to Peabody Myers Corporation, Streator, Ill.

Filed Dec. 23, 1983, Ser. No. 564,848

Int. Cl.[4] B01B *33/00*

U.S. Cl. 210—780 **20 Claims**



1. A method for using a vehicle for recycling water used to clean piping system associated with sewer laterals and catch basins, the vehicle having a debris-receiving container and a water reservoir for storing water, comprising the steps of:

(a) injecting water from the water reservoir under pressure into the piping system to loosen the debris located therein;

(b) pneumatically conveying the water and loosened debris from the piping system into said debris-receiving container;

(c) drawing the water so conveyed through a fine filtration media located in a portion of said debris-receiving container to remove debris from such reclaimed water, thereby producing filtered reclaimed water; and

(d) injecting said filtered reclaimed water into the piping system by by-passing entirely the water reservoir to continue the cleaning of the piping system.

4,578,199

CYCLONE SEPARATORS

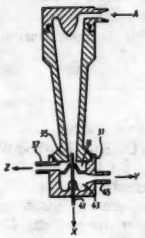
John D. Peel, Cheshire, and Paul A. Knight, Lancashire, both of England, assignors to Beloit Corporation, Beloit, Wis.

Continuation of Ser. No. 520,021, Aug. 3, 1983, abandoned, which is a continuation-in-part of Ser. No. 346,176, Feb. 5, 1982, abandoned. This application Apr. 25, 1985, Ser. No. 726,303

Claims priority, application United Kingdom, Feb. 14, 1981, 8104678

Int. Cl.[4] B04C *5/04*

U.S. Cl. 210—788 **6 Claims**



1. A method of separating a relatively light, rejects portion of particulate matter from a relatively heavy, accepts portion of particulate matter carried by an aqueous fluid mixture of both portions thereof, comprising the steps:

(1) feeding a stream of the fluid mixture into the upper region of a substantially vertically-disposed cyclone separator tangentially thereof at an angle to the longitudinal axis of the separator;

(2) constraining all of the fluid mixture to move in a substantially unilateral, streamline flow spirally toward the lower region of the cyclone separator;

(3) establishing an air core along the longitudinal axis of the separator;

(4) maintaining the lower end of the separator open;

(5) intercepting and separating the rejects portion in a region near the longitudinal axis of the separator within, and above, the lower end thereof;

(6) guiding the remaining accepts portion between the intercepted rejects portion and the interior wall of the cyclone separator to the periphery of the lower end thereof;

(7) discharging both accepts and rejects portions of the fluid mixture through the lower end of the cyclone separator.

4,578,200

FABRIC SOFTENERS

James C. T. R. Burckett St. Laurent, Overijse, and Alfred Busch, Grimbergen, both of Belgium, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Nov. 29, 1984, Ser. No. 676,036

Claims priority, application United Kingdom, Dec. 20, 1983, 8333815

Int. Cl.[4] D06M *11/00*

U.S. Cl. 252—8.8 **10 Claims**

1. A method of softening fibres or fabrics which comprises contacting said fibres or fabrics with a C_{8-20} alkyl amide derivative of a maleic anhydride-alkyl vinyl ether copolymer in the presence of water.

4,578,201

N-VINYL LACTAM/UNSATURATED AMIDE COPOLYMERS IN THICKENED ACID COMPOSITIONS

Lyle D. Burns, and G. Allan Stahl, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 5, 1984, Ser. No. 586,504

Int. Cl.[4] E21B *43/27*

U.S. Cl. 252—8.55 C 40 Claims

1. A water soluble thickened acid composition comprising:
(1) water;
(2) an acid; and
(3) a copolymer comprising a N-vinyl lactam monomer and an alpha, beta-unsaturated amide monomer made in the absence of a crosslinking agent during polymerization of said monomers.

4,578,202

CUTTING OIL FOR WORKING NONFERROUS METALS BY CUTTING

Manfred Urban, Weiterstadt, and Dieter Schmitt, Darmstadt, both of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Dec. 22, 1983, Ser. No. 564,458

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1982, 3247426

Int. Cl.[4] C10M *105/08, 105/22, 105/72*

U.S. Cl. 252—33.4 18 Claims

1. A cutting oil useful for the working of nonferrous metals by cutting, consisting essentially of effective amounts of (a) a fatty acid ester of a monohydric or polyhydric C_{1-3}-alcohol, (b) a solvent which is a C_{2-4}-glycol, or an oligoglycol or a polyglycol thereof, or a monoether or diether thereof with a C_{1-4}-alkyl group, phenyl or benzyl, or a monoester or diester thereof with C_{1-4} alkanoyl or benzoyl, and which is liquid at room temperature, and (c) a surfactant effective to solubilize or disperse the cutting oil in an alkaline degreasing bath.

4,578,203

POLYMER SOLUTION WORKING FLUID FOR FINISHING PROCESSES

Helmut Franz; James H. Hanlon, both of Pittsburgh, and Lloyd G. Shick, Natrona Heights, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 1, 1983, Ser. No. 481,418

Int. Cl.[4] C10M *149/10, 173/02*

U.S. Cl. 252—49.3 18 Claims

1. In a method of processing a nonmetallic substrate wherein a working fluid is supplied at the interface between the substrate and a working tool, and the substrate is exposed to particulate contaminants, the improvement which comprises supplying a working fluid comprising a solution of a soluble film-forming polymer in an amount which prevents adherence of particulate contaminants on the substrate surface in a solvent selected from the group consisting of water, water-miscible alcohols, water-miscible ketones, and mixtures thereof.

4,578,204

HIGH VOLTAGE ELECTROLITE

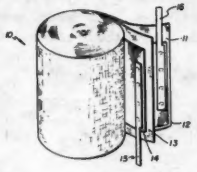
Daniel J. Anderson, Indianapolis, Ind., assignor to Emhart Industries, Inc., Indianapolis, Ind.

Filed Apr. 20, 1984, Ser. No. 602,543

Int. Cl.[4] H01G *9/00*

U.S. Cl. 252—62.2 8 Claims

1. An electrolytic capacitor having a sparking voltage of at least 620 volts comprising a pair of electrodes at least one of which is composed essentially of a film-forming metal and has a dielectric oxide film thereof, and an electrolyte consisting essentially of a liquid salt of a tertiary amine and glacial acetic



acid, said liquid salt dissolved in a mono-alkyl ether of diethylene glycol in a weight ratio of about 1:3 to 1:9.

4,578,205

USE OF METHYLENE AZELAIC ACID AS A CORROSION INHIBITOR

Ernest L. Yeakey; George P. Speranza; Carol A. Triebel, and David R. McCoy, all of Austin, Tex., assignors to Texaco, Inc., White Plains, N.Y.

Filed Feb. 1, 1985, Ser. No. 697,193

Int. Cl.[4] C09K *5/00*

U.S. Cl. 252—76 12 Claims

1. A corrosion-protected antifreeze composition comprising
a. a glycol component selected from the group consisting of an alkylene glycol, an alkylene glycol ether and mixtures thereof, and
b. an effective, corrosion-preventing amount of a methylene azelaic acid component selected from the group consisting of methylene azelaic acid alone having the formula $CH_2{=}C{-}[CH_2)_3{-}COOH]_2$ and alkali metal salts thereof said the methylene azelaic acid component present in a proportion ranging from about 1.5 to 4.5% based on the glycol component.

4,578,206

DETERGENT BLEACH COMPOSITIONS

Adrian W. Walker, Irby, Great Britain, assignor to Lever Brothers Company, New York, N.Y.

Filed Jun. 13, 1984, Ser. No. 619,975

Claims priority, application United Kingdom, Jun. 20, 1983, 8316761

Int. Cl.[4] C11D *7/54, 3/395;* D06L *3/02*

U.S. Cl. 252—95 5 Claims

1. A carbonate built detergent bleach composition comprising:
(I) from about 2 to 50% by weight of a surface active agent, selected from the group consisting of anionic, nonionic, zwitterionic and cationic detergents, and mixtures thereof;
(II) from 5 to 80% by weight of an alkali metal carbonate builder;
(III) from 5 to 50% by weight of a peroxide compound bleach;
(IV) from 0.1 to 25% by weight of a peracid precursor which reacts with the peroxide compound in solution forming a peracid; and
(V) from 0.005 to 0.1% by weight of manganese (II) ions.

4,578,207

TWO COMPONENT CLEANER AND DISINFECTANT TABLET

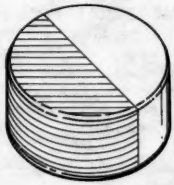
Bernd-Dieter Holdt, Düsseldorf; Ronald Menke, Mettmann; Gerd Praus, Krefeld, and Petra Hasselbach, Düsseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 452,943, Dec. 27, 1982, abandoned. This application Dec. 14, 1983, Ser. No. 561,285

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1982, 3225292

Int. Cl.[4] C11D *17/00*

U.S. Cl. 252—134 1 Claim



1. A two-component cleaning and disinfecting tablet for urinals and toilet flush tanks comprising extruded component A consisting essentially of (a) 25 to 50% by weight of an alkylbenzene sulfonate, (b) 20 to 30% by weight of inorganic alkali metal salts, (c) 5 to 10% by weight of at least one plasticizer, (d) 10 to 20 by a weight of at least one disintegration rate regulator selected from the group consisting of fatty acid ethanolamides, fatty acid diethanolamides and stearic acid, and (e) 5 to 30% by weight of a chlorine releasing compound and extruded component B consisting essentially of (a') 30 to 40% by weight of an alkylbenzene sulfonate, (b') 30 to 45% by weight of inorganic alkali metal salts, (c') 0 to 10% by weight of at least one plasticizer, (d') 10 to 15% by weight of at least one disintegration rate regulator selected from the group consisting of fatty acid ethanolamides, fatty acid diethanolamides and stearic acid, (e') 1 to 10% by weight of perfume and (f') 5 to 15% by weight of dye, the sum of (c') and (e') being not greater than 10% by weight, components A and B being attached together and occupying different portions of the final tablet.

4,578,208

COMPOSITIONS AND PROCESSES FOR CLEANING AND PASSIVATING METALS

Jüergen Geke, Duesseldorf, and Bernd Stedry, Kempen, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed May 4, 1984, Ser. No. 607,347

Claims priority, application Fed. Rep. of Germany, May 7, 1983, 3316724

Int. Cl.[4] C11D *1/34, 17/08*

U.S. Cl. 252—135 19 Claims

1. An aqueous composition for cleaning or passivating metal surfaces constisting essentially of

(a) from about 0.01 to about 1.0 g/l of at least one phosphoric acid ester selected from the following:

(i) mono- or diester of phosphoric acid with C_{10}–C_{20} alkanols,

(ii) mono- or diester of phosphoric acid with C_2–C_3 alkoxylated C_{10}–C_{20} alkanols,

(iii) phosphoric acid ester of poly-C_2–C_3-aklylene glycol ether,

(iv) a water solube salt of any of the foregoing;

(b) from about 0.25 to about 25 g/l of at least one alkanolamine or carboxylic acid salt of said alkanolamine;

(c) from about 0.001 to about 1 g/l of at least one nonionic surfactant.

4,578,209

COMPOSITION FOR CLEANING SURFACE OF SUBSTRATE

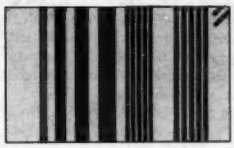
Iwao Hisamoto, Suita, and Yukio Omure, Takatsuki, both of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Continuation of Ser. No. 497,724, May 24, 1983, abandoned. This application Feb. 20, 1985, Ser. No. 703,456

Claims priority, application Japan, May 24, 1982, 57-88692

Int. Cl.[4] C11D *3/43, 7/50*

U.S. Cl. 252—143 1 Claim



1. A composition for cleaning a surface of a substrate consisting essentially of: (a) a halogenated hydrocarbon solvent selected from the group consisting of; an aliphatic hydrocarbon substituted by at least one chlorine atom, an aliphatic hydrocarbon substituted by at least one fluorine atom, an aliphatic hydrocarbon substituted by at least one bromine atom, an aromatic hydrocarbon substituted by at least one chlorine atom, an aromatic hydrocarbon substituted by at least one fluorine atom, an aromatic hydrocarbon substituted by at least one bromine atom, and mixtures of the above recited halogenated hydrocarbon compounds, (b) a fluorine-containing alcohol selected from the group consisting of;

$H(CF_2CF_2)_eCH_2OH$,

$H(CF_2CF_2)_fCH_2OH$,

CF_3

$H(CF_2CF_2)_gCHOH$,

CH_3

$H(CF_2CF)_dCHOH$,

CF_3 CH_3

$F(CF_2CF_2)_eCH_2OH$,

$F(CF_2CF_2)_fCH_2OH$,

CF_3

$F(CF_2CF_2)_gCH_2CH_2OH$,

$F(CF_2CF)_fCH_2CH_2OH$,

CF_3

$F(CF_2CF_2)_fCH_2CH_2CH_2OH$,

$F(CF_2CF)_fCH_2CH_2CH_2OH$,

CF_3

$H(CFClCF_2)_kCH_2OH$,
$H(CF_2CF_2)_fC(CH_3)_2OH$,
$H(CF_2CF_2)_mC(C_3H_7)HOH$,
$CF_3CF_2O(CF_2CF_2O)_nCF_2CH_2OH$,
$CF_3CF_2CF_2O[CF(CF_3)CF_2O]_pCF(CF_3)CH_2OH$,
$(CF_3)_2CF(CF_2CF_2)_pCH{=}CHCH_2OH$,
$HOCH_2(CF_2CF_2)_eCH_2OH$,
$HOCH_2CH_2(CF_2CF_2)_fCH_2CH_2OH$,
$HOCH_2CF_2CFH(CF_2CF_2)_fCFHCF_2CH_2OH$,
$HOCH_2CF_2CH_2(CF_2CF_2)_fCH_2CF_2CH_2OH$, and mixtures

-continued
of the above-recited alcohols,

wherein each of a, c, e, g and i is an interger of 1 to 5 and each of b, d, f, h and j to t is an integer of 1 to 3, and (c) an organic acid selected from the group consisting of; an aliphatic sulfonic acid, an aromatic sulfonic acid, and mixtures of the above-recited organic acids in a weight ratio within a range of 20 to 75/5 to 40/5 to 75.

4,578,210

CARBOCYCLIC SIX-MEMBERED RING COMPOUNDS

Klaus Praefcke; Bernd Kohne; Wadi Poules, all of Berlin; Rudolf Eidenschink, Münster, and Bernhard Scheuble, Alsbach-Hähnlein, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

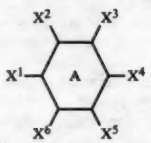
Filed Sep. 13, 1984, Ser. No. 650,015

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1983, 3332955

Int. Cl.[4] G02F *1/13*; C09K *3/34*

U.S. Cl. 252—299.6 10 Claims

1. A discotic, liquid-crystal phase containing at least two liquid-crystal components, wherein at least one of said components is



wherein

A is a benzene or cyclohexane ring,

X^1 to X^6 independently of one another in each case are H, —OR, —COOR, —SR, —SOR, or $—SO_2R$ or, when A is a cyclohexane ring, also —O—COR, and

R is in each case alkyl of up to 15 C atoms or alkyl of up to 15 C-atoms wherein one or two CH_2 groups are replaced by O atoms,

at least three of the substituents X^1 to X^6 being other than H.

4,578,211

PROCESS FOR THE PREPARATION OF RARE EARTH OXYHALIDE PHOSPHOR

Jacob G. Rabatin, Montville, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 483,335, Apr. 8, 1983, abandoned. This application Jan. 14, 1985, Ser. No. 691,323

Int. Cl.[4] C09K *11/475*

U.S. Cl. 252—301.4 H 2 Claims

1. A process for the preparation of lanthanum and gadolinium oxyhalide phosphor crystals selected from the group consisting of oxychlorides and oxybromides activated with thulium ion consisting essentially of recrystallized phosphor crystals having an average median particle size in the range extending from approximately 3.0 microns diameter up to approximately 9.0 microns diameter along with a more narrow particle size distribution and polyhedral shape with retarded crystal growth in the fastest crystal growth direction comprising the following steps:

(a) heating mixtures of particles of oxides selected from lanthanum and gadolinium oxides, including mixtures thereof, which further contains thulium ion in activator amounts from about 0.0005 to 0.01 mole per mole of the phosphor and an ammonium halide whose halide ion is that of the selected oxyhalide, along with sufficient lutetium ion to produce a lutetium level in said phosphor from about 0.01 to 0.2 mole per mole of the phosphor for a time and temperature sufficient to form the selected oxyhalide phospor, and

(b) reheating the resultant oxyhalide phosphor mixture with an alkali metal halide flux mixture whose halide ions are that of the selected oxyhalide phosphor to a temperature not exceeding approximately 900° C. for a time sufficient to recrystallize said selected oxyhalide phosphor and produce phosphor crystals with greater thickness said phosphor crystals having a smaller average median particle size than the phosphor crystals prepared as above absent lutetium.

4,578,212

LEAD ACTIVATED LUMINESCENT MATERIAL AND PROCESS FOR ITS PRODUCTION

Akos Kiss, Aschaffenburg; Peter Kleinschmit, Hanau; Werner Völker, Bad Vilbel, and Günter Halbritter, Schöllkrippen, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 4, 1985, Ser. No. 719,954

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1984, 3414847

Int. Cl.[4] C09K *11/36*

U.S. Cl. 252—301.4 F 11 Claims

1. A lead activated luminescent material consisting essentially of:

10 to 89.9 mole % zirconium oxide (ZrO_2)

5 to 85 mole % boron oxide (B_2O_3)

5 to 85 mole % silicon dioxide (SiO_2)

0.1 to 20 mole % lead oxide (PbO)

0 to 15 mole % sodium oxide (Na_2O)

0 to 15 mole % potassium oxide (K_2O) and

0 to 5 mole % aluminum oxide (Al_2O_3),

and exhibiting an emission band at about 480 nm when excited by 366 nm or 254 nm radiation.

4,578,213

HIGH TEMPERATURE PLASTIC SCINTILLATOR

John J. Simonetti, Cranbury, N.J., assignor to Sangamo Weston, Inc., Norcross, Ga.

Filed Apr. 27, 1984, Ser. No. 604,699

Int. Cl.[4] C09K *11/06*

U.S. Cl. 252—301.17 4 Claims

1. As an article of manufacture, a plastic scintillator which will function at high temperatures and retain its optical properties, said scintillator comprising a polymethylpentene host plastic containing an aromatic hydrocarbon fluorescent agent.

4,578,214

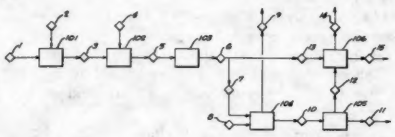
PROCESS FOR AMMONIA SYNGAS MANUFACTURE

Robert R. J. Jungerhans, Pasadena, Calif., assignor to C F Braun & Co., Alhambra, Calif.

Filed Feb. 6, 1984, Ser. No. 577,643

Int. Cl.[4] C01C *1/04*

U.S. Cl. 252—376 8 Claims



8. An improved process for reforming hydrocarbons to obtain a synthesis gas containing an approximately stoichiometric amount of hydrogen and nitrogen from which ammonia may be formed in which a hydrocarbon is reacted with steam and air in a reforming operation to obtain a first effluent comprising hydrogen, nitrogen and carbon monoxide, the carbon monoxide being reacted in a shift conversion stage to produce

a second effluent comprising hydrogen, nitrogen, and carbon dioxide, said improved process comprising the additional steps of separating said second effluent into a first stream and a second stream, said first stream being reacted with air in a fuel cell to produce a byproduct stream and a product stream which is passed through a de-oxygenation stage to produce a purified stream, said second stream and said purified stream being passed into a pressure swing adsorption unit in which the synthesis gas and a waste fuel stream are separated.

4,578,215
ELECTRICAL CONDUCTIVITY-ENHANCING AND PROTECTING MATERIAL

Robert F. Bradley, New Buffalo, Mich., assignor to Micro-Circuits Company, New Buffalo, Mich.

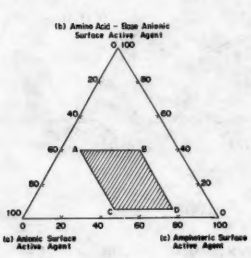
Filed Aug. 12, 1983, Ser. No. 522,848
Int. Cl.[4] H01B *1/02*
U.S. Cl. 252—514 **29 Claims**

1. A material for protecting and enhancing the conductivity of electrical connections, comprising a fluid corrosion retarding, organic carrier medium, including silicones, suspending a solid particulate component therein for distributing and retaining the particulate component on an electrical connection, and an electrically conductive component in particulate form, selected from the group consisting of silver, nickel, copper, tin, lead, tungsten, carbon black, alloys of said group and particles coated with a member of said group, mixed with and suspended in the carrier medium, and being present in the amount of 0.015 to 0.15 volumes of said component per one volume of said carrier medium for facilitating electron transfer by providing multiple, parallel conductive paths for electrical current flow.

4,578,216
SHAMPOO COMPOSITION CONTAINING AMINO ACID-ANIONIC AND AMPHOTERIC SURFACE ACTIVE AGENTS

Kozo Fujii, Sakura, and Takeo Okumura, Funabashi, both of Japan, assignors to Kao Corporation, Tokyo, Japan

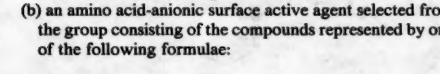
Filed Nov. 30, 1984, Ser. No. 677,014
Claims priority, application Japan, Dec. 21, 1983, 58-241666
Int. Cl.[4] C11D *1/10, 1/14*
U.S. Cl. 252—542 **4 Claims**



1. A shampoo composition comprising:

(a) an anionic surface active agent excluding amino acid-anionic surface active agents;

(b) an amino acid-anionic surface active agent selected from the group consisting of the compounds represented by one of the following formulae:



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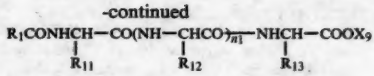
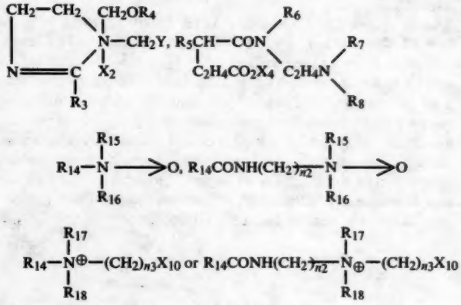


wherein R_1 is an alkyl or alkenyl group having from 7 to 21 carbon atoms, R_2 represents a hydrogen atom or an alkyl group having from 1 to 3 carbon atoms, and X_1, X_7 and X_8 independently represent a hydrogen atom or a counter ion selected from the group of alkali metal ions, alkaline earth metal ions, ammonium ion, ammonium ions substituted with an alkyl group having from 1 to 3 carbon atoms, alkanolamine bases having a hydroxyalkyl group containing from 1 to 3 carbon atoms, and basic amino acids; and wherein R_{11}, R_{12} and R_{13} independently represent a side chain of an amino acid, n_1 has a value of from 1 to 6, and X_9 represents a hydrogen atom or a counter ion as defined for X_1, X_7 and X_8; and

(c) an amphoteric surface active agent selected from the group consisting of a compound having one of the following formulae:



wherein R_3 represents an aliphatic acid residue having from 10 to 20 carbon atoms, R_4 represents sodium, hydrogen atom or $—CH_2COOX_3$, Y represents $—COOX_3$—CH_2COOX_3 or $—CH(OH)CH_2SO_3X_3$ wherein X_3 represents sodium, a hydrogen atom or an organic base, and X_2 represents a hydroxyl group, an acidic salt or anionic surface active sulfate or sulfated compound; R_5 represents an alkyl or alkenyl group having from 6 to 20 carbon atoms, R_6 represents a hydrogen atom, $—C_2H_4OH$ or $—C_2H_4OC_2H_4COOX_4$, R_7 represents $—C_2H_4OH$, $—C_2H_4OC_2H_4COOX_4$ or $—C_2H_4COOX_4$, R_8 represents a hydrogen atom or $—C_2H_4COOX_4$, and X_4 represents a hydrogen atom, an alkali metal, ammonium or organic ammonium; R_{14} represents an alkyl or alkenyl group having from 10 to 20 carbon atoms, R_{15} and R_{16} are the same or different and represent an alkyl group having from 1 to 3 carbon atoms, n_2 is an integer of from 1 to 4; R_{17} and R_{18} independently represent an alkyl group having from 1 to 4 carbon atoms, n_3 is an integer of from 1 to 3, X_{10} represents $—COO^-$ or $—SO_3^-$ group; and wherein the total amount of the three ingredients (a), (b) and (c) ranges from 5 to 30 wt.% of the composition, the mixing ratios of the three ingredients being within a composition range contained by lines plotted between the following points A, B, C and D of the ternary composition triangular diagram as shown in the accompanying figure;

A: (a)=50.0, (b)=40.0, (c)=10.0
B: (a)=20.0, (b)=40.0, (c)=40.0
C: (a)=50.0, (b)=5.0, (c)=45.0
D: (a)=20.0, (b)=5.0, (c)=76.0.

4,578,217

SYNTHETIC ANTIGENIC PEPTIDE DERIVED FROM HEPATITIS B SURFACE ANTIGEN

John Vnek, Bronx; Alfred M. Prince, Pound Ridge, and Hafeez Ikram, Corona, all of N.Y., assignors to New York Blood Center, Inc., New York, N.Y.

Filed May 12, 1983, Ser. No. 493,904
Int. Cl.[4] C07C *103/52*
U.S. Cl. 260—112.5 R 2 Claims

1. A synthetic peptide consisting essentially of the following sequence of amino acids

Arg Trp Met Met Leu Arg Arg.

4,578,218

PURIFICATION OF FACTOR VIII WITH INSOLUBLE MATRIX HAVING FREE SULFATE GROUPS COVALENTLY BOUND THERETO

Richard H. Saundry, London, and Geoffrey F. Savidge, Kent, both of England, assignors to The Special Trustees for St. Thomas' Hospital, London, England

Filed Feb. 8, 1985, Ser. No. 699,957
Claims priority, application United Kingdom, Feb. 9, 1984, 8403473
Int. Cl.[4] C07G *7/00;* A61K *35/16, 35/14*
U.S. Cl. 260—112 B 11 Claims

1. A process for the purification of Factor VIII complex, or one or more components thereof, comprising treating an impure preparation of Factor VIII complex with an insoluble matrix having free sulfate groups covalently bound thereto, in a medium of sufficiently high pH and sufficiently low ionic strength for a sufficient period of time to cause a substantial proportion of the Factor VIII complex to bind to said matrix, and subsequently selectively eluting the bound Factor VIII complex or the desired Factor VIII component.

4,578,219

ANTIGENIC PEPTIDE COMPOUND

Erwin Goldberg, Evanston, Ill., and Thomas E. Wheat, Chicago, Ill., assignors to Northwestern University, Evanston, Ill.

Filed Oct. 19, 1984, Ser. No. 663,058
Int. Cl.[4] C07C *103/52*
U.S. Cl. 260—112.5 R 1 Claim

1. The antigenic peptide compound binding to LDH-C_4 antisera represented by the sequence of N-terminal to C-terminal amino acids, comprising V-N-M-T-A-G-E-E-G-L-L-K-K, wherein G represents glycine, and V, N, M, T, A, E, G, L, and K respectively represent the L-amino acid forms of valine, asparetic acid, methionine, threonine, alanine, glutamic acid, leucine, and lysine.

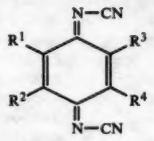
4,578,220

CHARGE TRANSFER COMPLEXES OF TETRATHIO/SELENO-FULVALENE DERIVATIVES AND BISCYANIMINE DERIVATIVES; BISCYANIMINE DERIVATIVES AND METHOD FOR PRODUCING SAME

Siegfried Huenig, Wuerzburg, and Alexander Aumueller, Lichtenfels, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

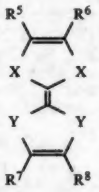
Filed Oct. 18, 1984, Ser. No. 662,049
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1983, 3337887
Int. Cl.[4] C07C *121/54;* C07D *409/04, 421/04;* C09K *15/58*
U.S. Cl. 260—239 R 13 Claims

1. A charge transfer complex of a biscyanimine of the formula



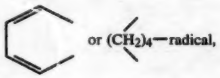
(I)

and a compound of the formula

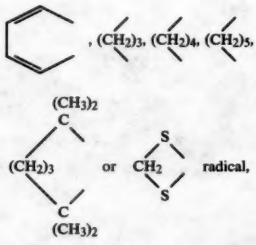


(II)

where R^1, R^2, R^3 and R^4 independently of one another are each hydrogen, methyl, ethyl, methoxy, ethoxy, chlorine or bromine, or one of the radicals R^1 and R^2 or one of the radicals R^3 and R^4 is phenyl or tert.-butyl, or one of the radicals R^1 and R^2 and one of the radicals R^3 and R^4 are each phenyl or tert.-butyl, or R_1 and R_2 taken together, or R_3 and R_4 taken together independently form a

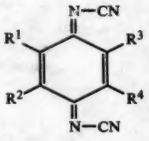


and the fused-on aromatic rings are unsubstituted or monosubstituted or disubstituted by chlorine, bromine or methyl, and R^5, R^6, R^7 and R^8 independently of one another are each hydrogen, methyl, ethyl, phenyl, methylphenyl or methoxyphenyl, or R_5 and R_6 taken together, or R_7 and R_8 taken together, independently form a



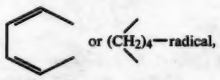
and X and Y independently of one another are each S or Se.

5. A biscyanimine of the formula



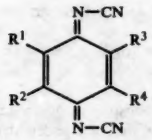
where R^1, R^2, R^3 and R^4 independently of one another are each hydrogen, methyl, ethyl, methoxy, ethoxy, chlorine or

bromine, or one of the radicals R^1 and R^2 or one of the radicals R^3 and R^4 is phenyl or tert.-butyl, or one of the radicals R^1 and R^2 and one of the radicals R^3 and R^4 are each phenyl or tert.-butyl, or R_1 and R_2 taken together, or R_3 and R_4 taken together, independently form a

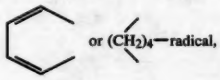


wherein the fused-on aromatic rings are unsubstituted or monosubstituted or disubstituted by chlorine, bromine or methyl.

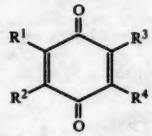
8. A process for the preparation of a biscyanimine of the formula



where R^1, R^2, R^3 and R^4 independently of one another are each hydrogen, methyl, ethyl, methoxy, ethoxy, chlorine or bromine, or one of the radicals R^1 and R^2 or one of the radicals R^3 and R^4 is phenyl or tert.-butyl, or one of the radicals R^1 and R^2 and one of the radicals R^3 and R^4 are each phenyl or tert.-butyl, or R_1 and R_2 taken together, or R_3 and R_4 taken together, independently form a



and the fuscd-on aromatic rings are unsubstituted or monosubstituted or disubstituted by chlorine, bromine or methyl, wherein a quinone of the formula



where R^1, R^2, R^3 and R^4 have the above meanings, is reacted with bistrimethylsilylcarbodiimide in a molar ratio of 1:2, in the presence of a catalyst and in an inert organic liquid.

4,578,221

ANDROSTANE CARBOTHIOIC ACIDS

Gordon H. Phillipps, Wembley; Brian M. Bain, Chalfont St. Peter, and Stuart B. Laing, Harrow, all of England, assignors to Glaxo Group Limited, England

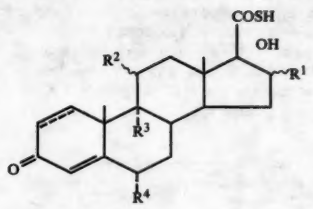
Continuation of Ser. No. 408,837, Aug. 17, 1982, abandoned, which is a continuation of Ser. No. 256,845, Apr. 23, 1981, abandoned. This application Jul. 14, 1983, Ser. No. 513,396

Claims priority, application United Kingdom, Apr. 23, 1981, 8013339

Int. Cl.⁴ C07J *3/00*

U.S. Cl. 260—397.1 **8 Claims**

1. A process for the preparation of a compound of the formula:



I

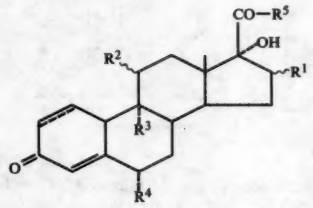
wherein

R^1 represents a hydrogen atom, a hydroxy group in the α-configuration, a methyl group which may be in either the α- or β-configuration or a methylene group;

R^2 represents a hydroxy or protected hydroxy group in either the α-or β-configuration or an oxo group;

R^3 represents a hydrogen, bromine, chlorine or fluorine atom; or R^2 and R^3 together represent a carbon-carbon bond or an epoxy group in the β-configuration;

R^4 represents a hydrogen or fluorine atom; and the symbol ==== represents a single or double bond; and the salts thereof, in which a compound of the formula:



III

wherein

R^1, R^2, R^3 and R^4 are as defined above and R^5 represents a group of the formula:

in which X, Y and Z, which may be the same or different, each represents CH or N, one or two of X, Y and Z being N, the heterocyclic ring optionally being substituted on at least one carbon atom by a lower alkyl group and/or where the heterocyclic ring contains two adjacent carbon atoms, the said ring optionally carrying a benzene ring fused to the said adjacent carbon atoms;

is reacted with hydrogen sulphide or a sulphide or hydrosulphide salt.

4,578,222

PROCESS FOR PREPARING A PERFLUORINATED OR POLYFLUORINATED ALIPHATIC CARBOXYLIC ACID

Nobuo Ishikawa, Yokohama, and Mitsuru Takahashi, Tokyo, both of Japan, assignors to Daikin Kogyo Co., Ltd., Yamaguchi and Toyo Soda Manufacturing Co., Ltd., Osaka, both of, Japan

Continuation of Ser. No. 566,115, Dec. 27, 1983, abandoned. This application Aug. 5, 1985, Ser. No. 762,228

Claims priority, application Japan, Dec. 31, 1982, 57-233997

Int. Cl.⁴ C07C *51/15*; C07G *13/00*

U.S. Cl. 260—413 **7 Claims**

1. A process for preparing a perfluorinated or polyfluorinated aliphatic carboxylic acid comprising reacting a perfluori-

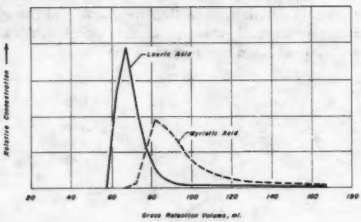
nated or polyfluorinated aliphatic halide of the formula R_fX, where R_f is a perfluorinated or polyfluorinated aliphatic group and X is a halogen atom, with carbon dioxide in the presence of zinc powder under the action of ultrasound and hydrolyzing the obtained product to form a perfluorinated or polyfluorinated aliphatic carboxylic acid of the formula: R_fCOOH where R_f is the same as defined above.

4,578,223

PROCESS FOR SEPARATING SATURATED FATTY ACIDS FROM EACH OTHER

Michael T. Cleary, Elmhurst, Ill., assignor to UOP Inc., Des Plaines, IL

Filed Oct. 9, 1984, Ser. No. 659,104
Int. Cl.[4] C11C *1/08*; C11B *3/10*
U.S. Cl. 260—419 **10 Claims**



1. A process for separating a first saturated fatty acid from a second saturated fatty acid contained in a feed mixture comprising said acids, the chain length of said first saturated fatty acid being at least two carbon atoms greater than that of said second saturated fatty acid, said process comprising contacting said feed mixture at a temperature in the range of from about 20° to about 200° C. and a pressure sufficient to maintain liquid phase with an adsorbent comprising a crystalline silica having a silica to alumina mole ratio of at least 12, thereby selectively adsorbing said first saturated fatty acid, removing the remainder of the feed mixture from the adsorbent, and recovering said first saturated fatty acid from said adsorbent by desorption a temperature in the range of from about 20° to about 200° C. and a pressure sufficient to maintain liquid phase with a desorbent liquid selected from the group consisting of methyl ethyl ketone, acetone and 3-pentanone.

4,578,224

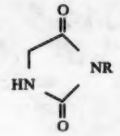
METHOD FOR PREPARATION OF SALTS OF N-PHOSPHONOMETHYLGLYCINE

Arthur C. Bayer, Yorktown Heights, N.Y.; Jeffrey D. Robbins, Berkeley, and Donald J. Bowler, Concord, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 435,122, Oct. 18, 1982, abandoned.
This application Jun. 20, 1984, Ser. No. 622,427
The portion of the term of this patent subsequent to Aug. 23, 2000, has been disclaimed.
Int. Cl.[4] C07F *9/38*
U.S. Cl. 260—502.5 F **9 Claims**

1. A method for the preparation of salts of N-phosphonomethylglycine which comprises the steps of:

(a) reacting hydantoin or a 3-substituted hydantoin, compounds of the general formula



wherein R is selected from the group consisting of hydrogen, alkyl having from 1 to 10 carbon atoms, aryl having from 6 to 12 carbon atoms, alkylcarbonyl wherein the alkyl group has from 1 to 10 carbon atoms, and arylcarbonyl wherein the aryl group has from 6 to 12 carbon atoms, with paraformaldehyde in the presence of a low molecular weight carboxylic acid at a temperature and for a sufficient period of time to produce a mixture of intermediate products, including the 1-(hydroxymethyl) derivative of the starting hydantoin

(b) converting said 1(hydroxymethyl) derivative to the 1-phosphonomethyl derivative by thereafter adding to the reaction mixture either

(i) a substituted phosphorus compound selected from the group consisting of phosphorus trichloride, and phosphorus tri-bromide; or

(ii) adding to the reaction mixture phosphorus acid and an anhydride selected from the group consisting acetic anhydride, propionic anhydride, butyric anhydride, or a similar asymmetrical anhydride and

continuing said reaction at a temperature and for a sufficient period of time to cause completion of the reaction to form the 1-phosphonomethyl derivative; and

(c) hydrolyzing the 1-phosphonomethylhydantoin product thus formed with a base selected from the group consisting of alkali metal or alkaline earth hydroxide, to produce a salt of N-phosphonomethylglycine.

4,578,225

MULTI-($OTEF_5$)-SUBSTITUTED FLUOROCARBONS

Carl J. Schack, Chatsworth, and Karl O. Christe, Calabasas, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 29, 1984, Ser. No. 617,456
Int. Cl.[4] C07C *165/00*
U.S. Cl. 260—550 **10 Claims**

1. A compound of the formula

$$C_nF_n(OTeF_5)_mX_p$$

wherein X is F, H or Cl, n is an integer in the range of 2 to 6, m is an even integer in the range of 2 to n and p is $(n-m+2)$.

9. A method for preparing an acyclic compound of the formula

$$C_nF_n(OTeF_5)_mX_p$$

wherein X is F, H or Cl, n is an integer in the range of 2 to 6, m is an even integer in the range of 2 to n and p is $(n-m+2)$, which comprises reacting xenon bis-pentafluorotellurium oxide with a fluorinated olefin having at least one double bond of the formula

$$C_nF_nX_q$$

wherein X is F, H or Cl, n is an integer in the range of 2 to 6 and q is an integer in the range of 2 to n, at an elevated pressure at a temperature in the approximate range of 50° to 150° C. above the atmospheric boiling point of said olefin for a time period in the approximate range of 10 to 150 hours.

4,578,226

VENTURI SCRUBBER FOR DUST-LADEN GASES

Wolfgang H. Adlhoch, Swisttal, and Johannes Lambertz, Kerpen, both of Fed. Rep. of Germany, assignors to Rheinische Braunkohlenwerke AG, Fed. Rep. of Germany

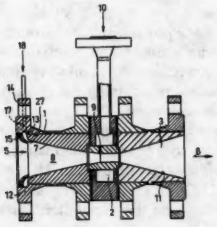
PCT No. PCT/DE84/00013, § 371 Date Sep. 19, 1984, § 102(e) Date Sep. 19, 1984, PCT Pub. No. WO84/02856, PCT Pub. Date Aug. 2, 1984

PCT Filed Jan. 19, 1984, Ser. No. 668,367

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1983, 3302148

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—71 8 Claims



1. A venturi scrubber for dust-laden flowing gases comprising:

an intake portion having a duct through which the gas flows, said duct through said intake portion having a cross-section that progressively decreases in the gas flow direction, said intake portion having a plurality of inlet conduits, said conduits tangentially intersecting the periphery of the largest cross-section of said intake portion;

a central portion having a duct through which the gas flows, said duct through said central portion having a first portion having a cross-section that progressively decreases in the gas flow direction, the largest cross-section of the first portion being adjacent and coaxial to the smallest cross-section of said duct through said intake portion, said duct through said central portion having a second portion having a cross-section that is constant, said second portion being coaxial with said first portion, said central portion having a plurality of radial bores therethrough, said bores intersecting said duct through said central portion at the junction of the first and second portions, whereby a first liquid being introduced into said duct through said central portion by said bores removes the dust in the gas;

a diffuser having a duct through which the gas flows, said duct of the diffuser having a cross-section which progressively increases in the direction of the gas flow, the smallest cross-section of the duct of the diffuser being adjacent to and coaxial with said second portion of said central portion;

a ring being adjacent the largest cross-section of said intake portion, a part of said ring and a part of said intake portion defining an annular duct therebetween, said annular duct extending along the entire periphery of said intake portion, a wall of said ring being parallel to a wall of said duct of said intake portion, whereby a second fluid being introduced into said annular duct from said inlet conduits, and said second fluid being under pressure; and

said ring and a wall of said duct of said intake portion defining a flow-through gap, said gap being perpendicular to said inner surface of said duct through said intake portion, whereby said second fluid exiting said annular duct through said gap, said second fluid forming a uniform thin film of the fluid around an inner surface of said duct through said intake portion, said second fluid adapted to remove any deposits of dust from the inner surface of the duct through said intake portion.

4,578,227

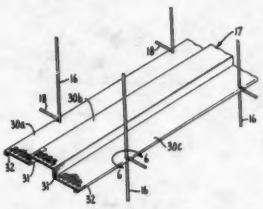
SPLASH BAR METHOD AND APPARATUS

John C. Ovard, 3465 Ridgeview Dr., Santa Rosa, Calif. 95404

Filed Mar. 15, 1984, Ser. No. 590,068

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—111 7 Claims



1. For use with a liquid cooling tower having a hot water distributor for distributing water onto a splash bar assembly structure, a cold water basin and means for inducing movement of air therebetween, a combination therewith of splash bar assembly structure comprising,

a series of elongated generally horizontal splash bar members;

means supporting said splash members in the space between the hot water distributor and said cold water basin in horizontal and vertical spaced relationship;

said splash bar members having their longitudinal axes positioned substantially horizontal;

each of said splash bar members having elongate substantially flat, perforated surfaced elements in parallel and vertically spaced apart relation; vertical strip elements spacing said perforated surface elements apart vertically by a distance less than the width of said splash bar members;

the perforations of said surface elements arranged in staggered rows and including semi-circular holes in alternate rows along the edges of said surface elements with the straight side of said semi-circular holes aligned with, and adjacent to said edges.

2. A method of cooling a liquid in a cross-flow cooling tower including a matrix of longitudinally extending splash bars each having a perforated substantially flat upper horizontal central strip and a pair of elongate perforated horizontal strips along the lateral edges of said central strip, said method comprising the steps of:

flowing air horizontally through said matrix along the longitudinal axes of said splash bars;

splashing warm liquid through said matrix in cross-flow within the said air flow;

directing a first portion of said liquid on said upper central strip;

fragmenting a first subportion of said first portion by splashing on imperforate sections of said central strip;

fragmenting a second subportion of said first portion by shear forces as said second subportion passes through said central strip;

further fragmenting certain of said first fragmented subportion by splashing on imperforate sections of said central strip or said lateral strips before said first fragmented subportion can be carried off by horizontal cross-flowing air;

directing a second portion of said liquid on said lateral strips;

fragmenting a first subportion of said second portion by splashing on imperforate sections of said lateral strips;

fragmenting a second subportion of said second portion by shear forces as said second subportion passes through said lateral strips;

distributing liquid across the imperforate surfaces of said central and said lateral strips;

draining liquid from the imperforate surfaces of said central and said lateral strips; and

repeating said flowing, splashing, directing, fragmenting, distributing and draining steps through said matrix for maximum heat exchange between said liquid and air.

4,578,228

CARBURETOR FOR AN INTERNAL COMBUSTION ENGINE

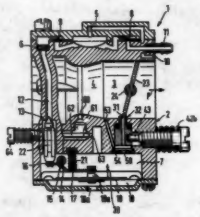
Reinhard Gerhardy, Korb, Fed. Rep. of Germany, assignor to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Nov. 1, 1984, Ser. No. 667,016

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1983, 3339714

Int. Cl.[4] F02M *3/08*

U.S. Cl. 261—41 D 17 Claims



1. Carburetor for an internal combustion engine, comprising:

a carburetor housing defining a carburetor bore communicating with the engine and through which a stream of air is drawn by suction when the engine is operating;

a plurality of fuel jets for delivering fuel into said bore and the stream of air flowing therethrough to form an air-fuel mixture for the engine;

a throttle flap pivotally mounted in said carburetor bore for adjusting the quantity of said mixture in dependence upon the operating condition of the engine;

said throttle flap being pivotable to an idle position whereat said throttle flap and the wall surface of said carburetor bore conjointly define an air gap for passing the air required for the idle operation of the engine;

a control compartment for holding the fuel for said fuel jets, said control compartment including an emulsion chamber;

one of said fuel jets being an idle speed fuel jet having its outlet opening in the region of said air gap, said idle speed fuel jet also communicating with said emulsion chamber;

air passage means for passing air to said emulsion chamber, said passage means having a pass-through opening communicating with said emulsion chamber; and,

an idle speed adjusting member movably mounted in said carburetor housing for movement into said air gap to vary the cross-sectional area thereof while at the same time blocking off more or less of said pass-through opening in dependence upon the position of said adjusting member so as to cause the ratio of fuel to air of the emulsion in said emulsion chamber to be adapted to the air supply required by the engine as said emulsion flows out from said idle speed fuel jet.

4,578,229

METHOD FOR THE MANUFACTURE OF OXIDIC SINTERED NUCLEAR FUEL BODIES

Helmut Assmann, Dormitz; Gerhard Dichtjär, Langenselbold; Wolfgang Dörr; Georg Maier, both of Herzogenaurach; Viktor Mathieu, Neuberg, and Martin Peehs, Bubenreuth, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Fed. Rep. of Germany

Filed Oct. 25, 1982, Ser. No. 436,303

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1981, 3142447

Int. Cl.[4] G21C *21/00*

U.S. Cl. 264—0.5 16 Claims

1. A method for the manufacture of oxidic nuclear fuel bodies comprising heat treating of blanks obtained from a nuclear fuel starting powder selected from thr group consisting of a UO_2 starting powder and a mixture of UO_2 and PuO_2 starting powder wherein the blanks are first heated in an oxidizing gas atmosphere containing a mixture of gases selected from the group consisting of CO_2 and air, CO_2 and O_2, and CO_2 and an inert gas, in a temperature range of 400° C. to 600° C. for 15 minutes to 2 hours while maintaining the gas atmosphere with oxidizing action to generate a crystallographically demonstrable U_4O_9 or $(U,Pu)_4O_9$ crystal phase in the blanks during the heating, and then are sintered in the same oxidizing atmosphere, in a treatment temperature range of 1000° C. to 1400° C., and finally are heated in a gas atmosphere with reducing action in a temperature range of 1000° C. to 1400° C. to produce an oxidic sintered nuclear fuel body which exhibits a micro-structure with uniformly distributed coarse grain which is stable against growth at the operating temperature in a nuclear reactor.

4,578,230

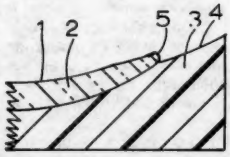
METHOD OF CONTOURING THE EDGE OF CONTACT LENSES

Charles W. Neefe, P.O. Box 429, Big Spring, Tex. 79720

Continuation-in-part of Ser. No. 670,386, Nov. 9, 1984, abandoned, which is a continuation-in-part of Ser. No. 544,468, Oct. 24, 1983, abandoned, which is a continuation-in-part of Ser. No. 417,642, Sep. 13, 1982, Pat. No. 4,416,837. This application Mar. 25, 1985, Ser. No. 715,732

Int. Cl.[4] B29D *11/00*

U.S. Cl. 264—2.1 18 Claims



3. A method of making a spin cast contact lens having a rounded edge by the steps of providing a concave spin casting concave casting mold made by injection molding using a material which is softer than the lens material to be cast in the concave mold, spin casting the lens material in the concave mold, cutting a concave curve on the periphery of the lens said curve intersecting both surfaces of the lens and the concave lens mold, the curve having a longer radius than that of either of the surfaces of the lens, abrading and polishing the longer radius peripheral curve and allowing the softer mold material to be abraded and removed at a faster rate than the harder lens material, exposing the lens edge, abrading and rounding the exposed edge of the lens, removing the lens from the concave spin casting mold.

4,578,231

PROCESS FOR THE PRODUCTION OF POLYOLEFIN FOAMS

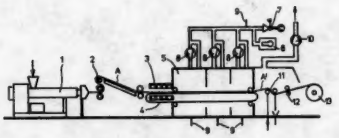
Emanuele Molteni, Inverigo, Italy, assignor to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Mar. 14, 1984, Ser. No. 589,620

Claims priority, application 03281983, Mar. 28, 1983, 83103046.5

Int. Cl.[4] B29C *67/22, 47/88;* C08J *3/24*

U.S. Cl. 264—25 9 Claims



1. In an improved process for the production of cross-linked polyolefin foams by mixing polyolefins with conventional foaming agents and cross-linking agents known for polyolefin foam production, shaping the mixture into a plate or into a continuous sheet, substantially without cross-linking and foaming, the improvement comprises mixing said mixture with up to 50% by weight of an α,β-unsaturated polyester, with or without heating the plate or sheet by IR radiation, and cross-linking and foaming by dielectric heating at a temperature above the decomposition temperature of the cross-linking and foaming agents.

4,578,232

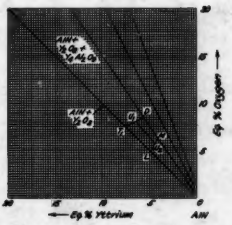
PRESSURELESS SINTERING PROCESS TO PRODUCE HIGH THERMAL CONDUCTIVITY CERAMIC BODY OF ALUMINUM NITRIDE

Irvin C. Huseby, Schenectady, and Carl F. Bobik, Burnt Hills, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 682,468, Dec. 17, 1984, abandoned. This application Apr. 29, 1985, Ser. No. 728,133

Int. Cl.[4] C04B *35/58;* F27D *7/06*

U.S. Cl. 264—65 26 Claims



1. A process for producing a sintered polycrystalline aluminum nitride ceramic body having a composition defined and encompassed by polygon LT1DM but not including lines LM and DM of FIG. 4, a porosity of less than about 10% by volume of said body and a thermal conductivity higher than 1.00 W/cm-K at 25° C. which comprises the steps:

(a) forming a mixture comprised of aluminum nitride powder containing oxygen, yttrium oxide and free carbon, shaping said mixture into a compact, said mixture and said compact having a composition wherein the equivalent % of yttrium and aluminum ranges from points T1 up to point M of FIG. 4, said yttrium ranging from greater than about 4.0 equivalent % to about 7.5 equivalent %, said aluminum ranging from about 92.5 equivalent % to less than about 96 equivalent %, said compact having an equivalent % composition of Y, Al, O and N outside the composition defined and encompassed by polygon LT1DM of FIG. 4,

(b) heating said compact in a nitrogen-containing nonoxidizing atmosphere at a temperature ranging from about 1350° C. to a temperature sufficient to deoxidize the compact but below its pore closing temperature reacting said free carbon with oxygen contained in said aluminum nitride producing a deoxidized compact, said deoxidized compact having a composition wherein the equivalent % of Al, Y, O and N is defined and encompassed by polygon LT1DM but not including lines LM and DM of FIG. 4, said free carbon being in an amount which produces said deoxidized compact, and

(c) sintering said deoxidized compact in a nitrogen-containing nonoxidizing atmosphere at a temperature of at least about 1855° C. producing said polycrystalline body.

4,578,233

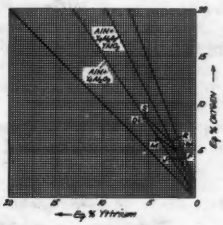
PRESSURELESS SINTERING PROCESS TO PRODUCE HIGH THERMAL CONDUCTIVITY CERAMIC BODY OF ALUMINUM NITRIDE

Irvin C. Huseby, Schenectady, and Carl F. Bobik, Burnt Hills, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 667,516, Nov. 1, 1984, abandoned. This application Apr. 29, 1985, Ser. No. 728,624

Int. Cl.[4] C04B *35/58;* F27D *7/06*

U.S. Cl. 264—65 24 Claims



1. A process for producing a sintered polycrystalline aluminum nitride ceramic body having a composition defined and encompassed by polygon FJDSR but not including line RF of FIG. 4, a porosity of less than about 10% by volume of said body and a thermal conductivity greater than 1.00 W/cm-K at 25° C. which comprises the steps:

(a) forming a mixture comprised of an oxygen-containing aluminum nitride powder, yttrium oxide, and free carbon, shaping said mixture into a compact, said mixture and said compact having a composition wherein the equivalent % of yttrium and aluminum ranges from point D up to point F of FIG. 4, said yttrium in said compact ranging from greater than about 1.6 equivalent % to about 5.5 equivalent %, said aluminum in said compact ranging from about 94.5 equivalent % to less than about 98.4 equivalent said compact having an equivalent % composition of Y, Al, %, O and N outside the composition defined and encompassed by polygon FJDSR of FIG. 4,

(b) heating said compact in a nitrogen-containing nonoxidizing atmosphere at a temperature ranging from about 1350° C. to a temperature sufficient to deoxidize the compact but below its pore closing temperature reacting said free carbon with oxygen contained in said aluminum nitride producing a deoxidized compact, said deoxidized compact having a composition wherein the equivalent % of Al, Y, O and N is defined and encompassed by polygon FJDSR but not including line RF of FIG. 4, said free carbon being in an amount which produces said deoxidized compact, and

(c) sintering said deoxidized compact in a nitrogen-contain-

ing nonoxidizing atmosphere at a temperature of at least about 1840° C. producing said polycrystalline body.

4,578,234

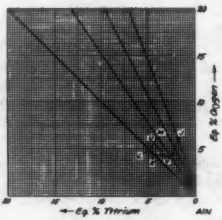
PROCESS OF PRESSURELESS SINTERING TO PRODUCE DENSE HIGH THERMAL CONDUCTIVITY CERAMIC BODY OF DEOXIDIZED ALUMINUM NITRIDE

Irvin C. Huseby, Schenectady, and Carl F. Bobik, Burnt Hills, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 656,636, Oct. 1, 1984, abandoned. This application Apr. 12, 1985, Ser. No. 722,639

Int. Cl.[4] C04B *35/58*; F27D *7/06*

U.S. Cl. 264—65 **23 Claims**



1. A process for producing a sintered polycrystalline aluminum nitride ceramic body having a composition defined and encompassed by polygon JKLM but not including line MJ of FIG. 4, a porosity of less than about 10% by volume of said body and a thermal conductivity greater than 1.00 W/cm.K at 25° C. which comprises the steps:

(a) forming a mixture comprised of an oxygen-containing aluminum nitride powder, yttrium oxide, and free carbon, shaping said mixture into a compact, said mixture and said compact having a composition wherein the equivalent % of yttrium and aluminum ranges from point L up to point J of FIG. 4, said yttrium ranging from greater than about 2.5 equivalent % to about 4.9 equivalent %, said aluminum ranging from about 95.1 equivalent % to less than about 97.5 equivalent %, said compact having an equivalent % composition of Y, Al, O and N outside the composition defined and encompassed by polygon JKLM of FIG. 4,

(b) heating said compact in a nitrogen-containing nonoxidizing atmosphere at a temperature ranging from about 1350° C. to a temperature sufficient to deoxidize the compact but below its pore closing temperature thereby reacting said free carbon with oxygen contained in said aluminum nitride producing a deoxidized compact, said deoxidized compact having a composition wherein the equivalent % of Al, Y, O and N is defined and encompassed by polygon JKLM but not including line MJ of FIG. 4, said free carbon being in an amount which produces said deoxidized compact, and

(c) sintering said deoxidized compact in a nitrogen-containing nonoxidizing atmosphere at a temperature of at least about 1860° C. producing said polycrystalline body.

4,578,235

METHOD FOR LINING PIPE

Jon A. Schmidgall, and Hartzell H. Schmidgall, both of Mediapolis, Iowa, assignors to Hawkeye Concrete Products Co., Mediapolis, Iowa

Filed Aug. 1, 1983, Ser. No. 519,350

Int. Cl.[4] B28B *1/08, 21/60, 21/88, 23/12*

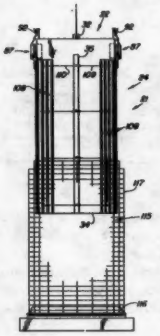
U.S. Cl. 264—71 **3 Claims**

1. A method of providing a liner for concrete pipe, during operation of a pipe-forming machine upon a mold having a core, comprising:

forming the liner around transport means disposed away from the pipe-forming machine;

tightly fitting the liner to the transport means by tightening means while spacing the tightening means away from the transport means;

moving the transport means to the pipe-forming machine and transferring the liner into the mold and over the core;



removing the transport means;

maintaining tension on the tightening means and spacing the tightening means from the mold's core while concrete is poured into the mold; and

relieving tension on the tightening means after the concrete has been poured and before vibrating the concrete has been completed.

4,578,236

TORUS TYPE NUCLEAR FUSION APPARATUS USING DEUTERIUM OR TRITIUM AS FUEL

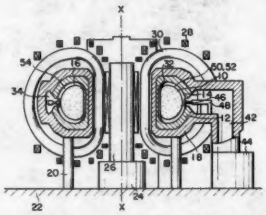
Yoshio Gomei, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 11, 1982, Ser. No. 377,015

Claims priority, application Japan, May 21, 1981, 56-75786

Int. Cl.[4] G21B *1/00*

U.S. Cl. 376—136 **1 Claim**



1. A toroidal nuclear fusion apparatus which uses deuterium or tritium as fuel and which generates a toroidally shaped plasma in a space enclosed by a first wall, said apparatus comprising:

(a) a first wall enclosing a toroidally shaped space which is symmetrical about a centrally located principal axis;

(b) means for producing a toroidally shaped plasma from deuterium or tritium in said toroidally shaped space, said toroidally shaped plasma being symmetrical about said principal axis;

(c) a main limiter made of high melting point material and having a large heat capacity, at least substantially the entirety of said main limiter being attached to said first

wall on the surface of said first wall adjacent to said centrally located principal axis;

(d) a gas evacuating annular channel provided inside said first wall, said gas evacuating annular channel being symmetrical about said principal axis and being located radially outwardly of said toroidally shaped space with respect to said centrally located principal axis;

(e) an annular slit providing fluid communication between said toroidally shaped space and said gas evacuating annular channel;

(f) an annular sub-limiter which neutralizes helium ions produced during operation of the nuclear fusion apparatus by transforming the helium ions into helium gas, said annular sub-limiter comprising a ring-shaped plate member disposed in said toroidally shaped space in front of said annular slit, the width of said ring-shaped plate exceeding the width of said annular slit and said ring-shaped plate being spaced from said first wall to define a helium ion guiding and flowing path between said annular sub-limiter and said first wall;

(g) a gas evacuating pump;

(h) a conduit defining a flow path between said gas evacuating annular channel and said gas evacuating pump; and

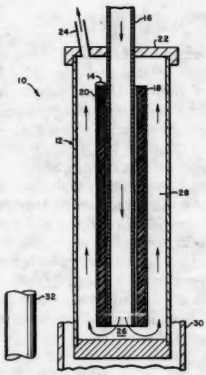
(i) a supporting leg for said annular sublimiter, said supporting leg being mounted on the inside of said conduit, extending through said annular slit, and being attached to the surface of said annular sub-limiter which is radially outward with respect to said centrally located principal axis, said supporting leg having a width which is less than the width of said annular slit, whereby an evacuating path for helium ions is formed between the walls of said annular slit and the adjacent surfaces of said supporting leg, the connecting portion between said supporting leg and said annular sub-limiter being provided with a slope which reflects helium ions which have passed through said helium ion guiding and flowing path between said annular sub-limiter and said first wall outwardly into said gas evacuating annular channel.

4,578,237

NONDESTRUCTIVE DETERMINATION OF NUCLEAR FUEL BURNUP

Walter J. Mordarski, Wallingford, and Jan Markiewicz, North Haven, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Sep. 9, 1983, Ser. No. 530,458
Int. Cl.[4] G21C *17/00*
U.S. Cl. 376—154 **15 Claims**



11. A method for measuring the burnup of nuclear fuel during refueling of a nuclear reactor, comprising:

removing the fuel from the reactor;

locating the fuel in an area accessible from above;

lowering a measurement capsule into close proximity to the fuel, said capsule including a metal container, a central support member removably supported within the container, a recording member carried by the support member, said recording member including a layer of solid state track recorder material adjacent to the support member and a coating of fissile material on the exterior of the recorder material;

positioning said capsule at a predetermined location for a period of time between approximately one hour and one day;

removing the capsule from the fuel and recording the time interval during which the capsule was positioned in close proximity to the fuel;

removing the support member and recording member from the capsule;

removing the recording member from the support member,

processing the recording member including the steps of removing the fissile coating, etching the solid state track recorder material, and counting the density of the number of tracks per unit area of track recorder material;

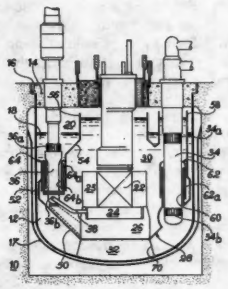
relating the neutron flux required to produce the track density counted, to the plutonium content of the fuel, to determine the fuel burnup.

4,578,238

FAST NEUTRON NUCLEAR REACTOR

Robert Artaud, Aix-en-Provence; Michel Aubert, Manosque, and Charley Renaux, Jouques, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Feb. 2, 1984, Ser. No. 576,195
Claims priority, application France, Feb. 22, 1983, 83 02859
Int. Cl.[4] G21C *1/02*
U.S. Cl. 376—404 **18 Claims**



1. In a liquid metal-cooled nuclear reactor incorporating a main vessel containing a reactor core resting therein on a supply support member, a slab sealing said main vessel, an inner vessel placed within the main vessel and defining in the latter a hot zone filled with relatively hot liquid metal and a cold zone filled with relatively cold liquid metal, at least one pump for circulating the liquid metal between the cold zone and the hot zone across the core and at least one heat exchanger disposed between the hot zone and the cold zone, said pump and said exchanger being suspended on the slab, wherein the inner vessel comprises an upper and a lower truncated cone-shaped ferrule each having a large base opposedly supported and a small diameter cylindrical ferrule extending the small base of the upper truncated cone-shaped ferrule, the reactor core resting on the small base of the lower truncated cone-shaped ferrule by means of a support structure, the hot zone being formed within the inner vessel, the cold zone being formed between the main vessel and the inner vessel, each

pump sealing traversing the upper truncated cone-shaped ferrule and having sucking orifices opening in the cold zone and discharge orifices communicating with said supply support member through at least one pipe, and each heat exchanger sealingly traversing both the upper and lower truncated cone-shaped ferrules and having inlets opening in the hot zone above the lower truncated cone-shaped ferrule and outlets opening in the cold zone below the lower truncated cone-shaped ferrule.

4,578,239

SPACER FOR FUEL ASSEMBLIES OF WATER-COOLED NUCLEAR REACTORS

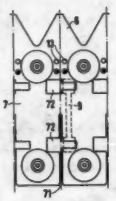
Alexander Steinke, Ebermannstadt, Fed. Rep. of Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Continuation of Ser. No. 190,983, Sep. 26, 1980, abandoned. This application Jun. 25, 1984, Ser. No. 623,631

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1979, 2941320

Int. Cl.[4] G21C *3/34*

U.S. Cl. 376—441 **5 Claims**



1. In a fuel assembly of a water-cooled nuclear reactor, said fuel assembly having fuel rods and spacer grids along said fuel assembly for centering the fuel rods in said assembly, each of said fuel spacers comprising a grid of first and second sheet metal webs formed of a zirconium alloy and being disposed on edge, rigid bumps formed from at least some of said webs for contacting a fuel rod, said first webs having relatively wide cutouts, relatively narrow lateral slots and enlargements of a portion of said slots coextensive with said cutouts and said slots formed therein, wherein each relatively wide cutout is coextensive with and interconnected to one relatively narrow lateral slot, said cutouts, narrow slots and enlargements being positioned in pairs such that each relatively wide cutout has a second relatively wide cutout directly aligned with it in a direction longitudinal to the axis of said fuel assembly and each relatively narrow slot with its enlargements has a second relatively narrow slot with its enlargements directly aligned with it in a direction longitudinal to the axis of said fuel assembly, and resilient contact elements formed of chrome nickel steel and having a head part, a base part, a resilient band connecting said head and base parts together into one piece and a bent-out point formed on said resilient band for contacting a fuel rod, said head and base parts of said contact elements being insertable respectively into a pair of said cutouts and movable from said pair of cutouts into a locked position in said lateral slots formed in said first webs, said resilient bands of said contact elements being snappable into said enlargements of said pair of slots formed in said webs for locking, and said second webs being free of said cutouts and said slots and being insertable into said first webs having said cutouts and slots for retaining said contact elements in place and forming a complete spacer grid.

4. In a fuel assembly of a water-cooled nuclear reactor, said fuel assembly having fuel rods and spacer grids along said fuel assembly for centering the fuel rods in said assembly, each of said fuel spacers comprising a grid of first and second sheet metal webs formed of a zirconium alloy and being disposed on edge, rigid bumps formed from at least some of said webs for contacting a fuel rod, said first webs having relatively wide cutouts and relatively narrow lateral slots coextensive with said cutouts formed therein, wherein each relatively wide cutout is coextensive with an interconnected to one relatively narrow lateral slot, said cutouts and narrow slots being positioned in pairs such that each relatively wide cutout has a second relatively wide cutout directly aligned with it in a direction longitudinal to the axis of said assembly and each relatively narrow slot has a second relatively narrow slot directly aligned with it in a direction longitudinal to the axis of said assembly, and resilient contact elements formed of chrome nickel steel and having a head part, a base part, a resilient band connecting said head and base parts together into one piece and a bent-out point formed on said resilient band for contacting a fuel rod, said head and base parts of said contact elements being insertable respectively into a pair of said cutouts and movable from said pair of cutouts into a locked position in said lateral slots formed in said first webs, and said second webs being free of said cutouts and said slots and being insertable into said first webs having said cutouts and said slots said first webs and said second webs each having means allowing insertion of said second webs into said first webs, said cutouts and said slots being so positioned in said first webs that said second webs will trap said contact elements in said slots of said first webs when said second webs are inserted into said first webs to form a complete spacer grid.

4,578,240

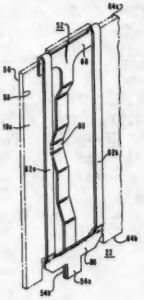
NUCLEAR REACTOR FUEL ASSEMBLY SPACER GRID

Dennis J. Cadwell, Plum Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 3, 1983, Ser. No. 454,927

Int. Cl.[4] G21C *3/34*

U.S. Cl. 376—441 **6 Claims**



1. A grid for the spacing of fuel rods and control rod guide thimbles in a nuclear reactor fuel assembly, comprising:

(a) a plurality of interleaved grid straps arranged in an egg crate configuration defining standard cells therein for the separate enclosure of each of said fuel rods and defining thimble cells therein for the separate enclosure of each of said control rod guide thimbles; and

(b) a first spring clip having an elongated band with two ends, coextensive first and second segments, and a middle equidistant from said two ends dividing said band into said first and second segments, with said band bent at said middle and disposed to widthwise encircle a first grid strap having two lengthwise edges, with said middle proximate one of said two lengthwise edges, and with said two ends attached together and disposed proximate the other of said two lengthwise edges;

(i) said first segment extending between said middle and one of said two ends and disposed generally within a first said thimble cell having a first said control rod guide thimble, with a first longitudinal axis and an outside diameter, contacting said first grid strap generally

along a contact line, said first segment having two generally flat portions disposed proximate said first grid strap, spaced apart on either side of said control rod guide thimble and said contact line, and disposed generally parallel to and having a length at least equal to said contact line;

(ii) said second segment extending between said middle and the other of said two ends and disposed generally within a first said standard cell having a first said fuel rod with a second longitudinal axis, said second segment having a spring portion disposed generally parallel to said second longitudinal axis and projecting generally perpendicularly away from said first grid strap toward said second longitudinal axis with said spring portion compressibly contacting said first fuel rod;

(iii) said second segment also having a second joining member coextensively connecting said two flat portions of said first segment proximate said one of said two lengthwise edges with said spring portion of said second segment; and

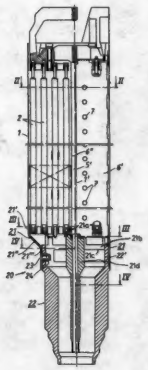
(iv) said first segment also having a first joining member which coextensively joins with said two flat portions of said first segment proximate said other of said two lengthwise edges and which extends to said one of said two ends, wherein said first joining member is axially disposed along said first longitudinal axis generally beyond said other of said two lengthwise edges and transversely disposed from said first longitudinal axis at a distance greater than that of said outside diameter of said first control rod guide thimble.

4,578,241

EARTHQUAKE-PROOF FUEL ASSEMBLY

Bo Borrman; Erik Hellman; Nils Lundin, and Bengt Ode, all of Västerås, Sweden, assignors to AB ASEA-ATOM, Sweden

Continuation of Ser. No. 362,411, Mar. 26, 1982, abandoned. This application Aug. 15, 1984, Ser. No. 641,073
Claims priority, application Sweden, May 15, 1981, 8103956
Int. Cl.[4] G21C *3/32*
U.S. Cl. 376—446 **2 Claims**



1. A fuel assembly for a boiling water reactor, comprising:

an inlet sleeve (22) of stainless steel;

an elongated zirconium alloy shroud (1,21) having a vertical center line (1') and a rectangular cross-section along most of its length;

bottom grid means (21*a*) supported by said inlet sleeve;

a plurality of fuel rods (2) supported by said bottom grid means;

an elongated internal, cruciform stiffening device for said shroud; said shroud enclosing said fuel rods, said bottom grid means and said stiffening device; said stiffening device extending along the entire length of said fuel rods, the vertical center line (4') of said stiffening device lying in the vicinity of said vertical center line of the shroud, said stiffening device having four wings (4) positioned in a vertical plane and arranged at an angular distance of about 90 degrees, each of said wings being mechanically connected to a corresponding wall of the shroud (1, 21);

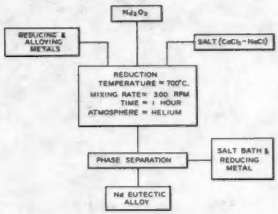
said shroud having an upper, relatively thin-walled zirconium alloy fuel channel portion (1) entirely located above the lowest point of said bottom grid means, as well as a lower, relatively thick-walled zirconium alloy transition sleeve portion (21), which surrounds and extends below said bottom grid means, said transition sleeve portion being welded directly to said fuel channel portion and having an average thickness constituting at least 130% of the average thickness of said fuel channel portion, said transition sleeve portion enclosing an upper portion of said inlet sleeve (22) and being secured to said inlet sleeve by means of a plurality of mechanical fasteners (23) inserted horizontally through the wall of said transition sleeve portion into the wall of said inlet sleeve; and each of said wings extending vertically along the whole length of said fuel channel portion (1).

4,578,242

METALLOTHERMIC REDUCTION OF RARE EARTH OXIDES

Ram A. Sharma, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 3, 1984, Ser. No. 627,737
Int. Cl.[4] C22B *59/00*; C22C *1/00*
U.S. Cl. 420—590 **21 Claims**



1. A non-electrolytic method of reducing rare earth oxide to rare earth metal comprising forming a molten salt bath comprised of calcium chloride; adding a volume of rare earth oxide less than the volume of the molten salt to said bath; adding an amount of sodium to said bath sufficient to form a stoichiometric excess of calcium metal based on the amount of rare earth oxide therein by the reaction

$$CaCl_2 + 2\,Na \rightarrow Ca + 2\,NaCl$$

and maintaining said bath in a molten state and agitating it such that the calcium metal reduces the rare earth oxide to rare earth metal.

4,578,243

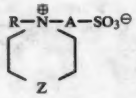
INHIBITING CORROSION WITH QUATERNARY AMMONIUM DERIVATIVES OF 1,4-THIAZINE SULFONIC ACIDS

Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 226,300, Jan. 19, 1981. This application May 28, 1985, Ser. No. 737,959
Int. Cl.[4] C23F *11/00, 11/04*
U.S. Cl. 422—7 **2 Claims**

1. A process of treating a metallic surface in contact with a

corrosive environment comprising adding to said environment a corrosion inhibiting amount of a composition having the formula



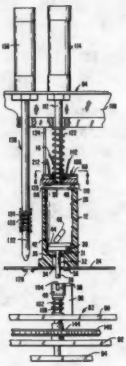
when R is selected from the group consisting of alkyl, cycloalkyl, aralkyl and hydroxyalkyl, A is alkylene, Z is S, SO or SO_2.

4,578,244

SAMPLING APPARATUS FOR OBTAINING A PLURALITY OF FLUID SAMPLES

Robert J. Cosgrove, Jr., Wanaque, N.J., and Victor F. Smolen, West Palm Beach, Fla., assignors to Pharmacontrol Corp., Englewood Cliffs, N.J.

Filed Apr. 23, 1982, Ser. No. 371,248
Int. Cl.[4] G01N *35/02*
U.S. Cl. 422—65 **25 Claims**



1. Sampling apparatus for obtaining a plurality of fluid samples, comprising:

a plurality of sampling containers each having a chamber therein for receipt of a fluid, each of said sampling containers including openings for communication with fluid conducting means, each of said openings extending in a first direction;

drive means for simultaneously moving said plurality of sampling containers to a sampling station;

first fluid conducting means for each of said sampling containers for conducting a fluid into each of said sampling containers when said sampling containers are positioned at said sampling station;

second fluid conducting means for each of said sampling containers for withdrawing a fluid sample from each of said sampling containers when said sampling containers are positioned at said sampling station; and

coupling means located at said sampling station for coupling said first and second fluid conducting means with said chambers of each of said sampling containers when said sampling containers are positioned at said sampling station, said coupling means including sealing means for individually sealing said chamber of each of said sampling containers when said first and second fluid conducting means are coupled to said sampling containers, said coupling means comprising moving means for moving said first and second fluid conducting means into fluid communication with said openings in said sampling containers, said moving means comprising means for moving said first and second fluid conducting means in said first direction and for applying a force along said first direction with respect to each of said sampling containers to clamp each of said sampling containers and its associated first and second fluid conducting means together to seal said openings.

4,578,245

MULTILAYER ANALYTICAL ELEMENT

Fuminori Arai, Asaka; Yoshio Inagaki, Minami-ashigara, and Masao Kitajima, Asaka, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 20, 1983, Ser. No. 534,085
Claims priority, application Japan, Sep. 22, 1982, 57-165233
Int. Cl.[4] G01N *21/78, 31/22;* C12Q *1/00*
U.S. Cl. 422—56 **7 Claims**

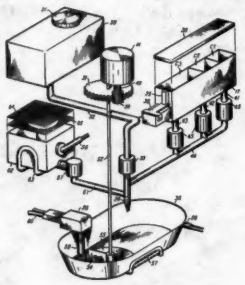
1. In a multilayer analytical element having a water-impermeable, light-transmissive support, a reagent layer containing a color forming reagent composition for detection of hydrogen peroxide including at least a combination of a chromogen and a coupler, and peroxidase, which produces a detectable change in the presence of peroxidase and hydrogen peroxide, and a porous spreading layer, which are superposed in this order, the improvement which comprises said chromogen being a 1,2,3,-tri-substituted compound of 4-amino-3-pyrazolin-5-one having a solubility in water at 25° C. lower than that of 4-amino-2,3-dimethyl-1-phenyl-3-pyrazolin-5-one.

4,578,246

APPARATUS FOR MAKING SOAP

Lonnie H. Pope, 3915 Post Oak Tritt, Marietta, Ga. 30062

Filed Mar. 19, 1984, Ser. No. 591,212
Int. Cl.[4] B01J *4/02;* B01F *7/20, 15/02*
U.S. Cl. 422—111 **11 Claims**



1. Household sized soap making apparatus for making small quantities of liquid soap from household cooking greases and the like comprising a housing comprising a mixing vessel, a grease receptacle for receiving and storing household waste grease, an alkali container for storing a liquid alkali, diluent supply means, conduit means extending from each of said grease receptacle, alkali container and diluent supply means to said mixing vessel for delivering grease, alkali and diluent to said mixing vessel, valve means operatively connected to said conduit means for controlling the delivery of grease, alkali and diluent to said mixing vessel, mixing means including a mixing blade positioned in said mixing vessel and an electric motor in driving relationship with said mixing blade for mixing the grease, alkali and diluent in said mixing vessel, means for sensing motor current drawn by said electric motor, and means for controlling said valve means to control the delivery of diluent in response to changes in levels of motor current sensed by said current sensing means so that when the viscosity of the soap being formed in the mixing vessel increases the motor current

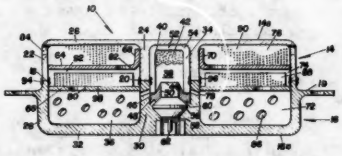
also increases and the control means actuates the valve means to deliver diluent to the mixing vessel.

4,578,247

MINIMUM BULK, LIGHT WEIGHT WELDED ALUMINUM INFLATOR

Christopher W. Bolieau, Brigham City, Utah, assignor to Morton Thiokol, Inc., Chicago, Ill.

Filed Oct. 29, 1984, Ser. No. 665,856
Int. Cl.[4] B01J *7/00*; F42B *3/04*
U.S. Cl. 422—165 **7 Claims**



1. A light weight housing construction of minimum bulk for gas generators using solid fuel for the generation of gas to inflate vehicle passive restraint inflatable crash protection bags comprising,

first, second, third and fourth structural components,

said first structural component forming a first generally cylindrical subassembly and including first and second concentric cylinders, each of which has an end, that extend from a first common substantially flat wall means integral therewith to form structural walls of the generator and at least one of which has exit holes for the passage of gas,

said second structural component forming a second generally cylindrical subassembly and including third and fourth concentric cylinders, each of which has an end, that extend from a second common substantially flat wall means integral therewith to form structural walls of the generator, and at least one of which has exit holes for the passages of gas,

the ends of said first and third and said second and fourth concentric cylinders providing mating surfaces to form therebetween, in cooperation with said first and second common wall means, inner and outer concentric chambers,

said third and fourth structural components being annular and substantially flat in form and positioned in said outer concentric chamber to form therein three separate annular chambers that are concentric with all of said concentric cylinders with a first annular chamber located adjacent said second common wall means, a third annular chamber located adjacent said first common wall means and a second annular chamber located between said first and third annular chambers, with said first and second annular chambers extending between said third and fourth concentric cylinders and said third annular chamber extending between said first and second concentric cylinders, said third and fourth structural components having exit holes for the passages of gas from one to another of said first, second and third annular chambers,

said first annular chamber containing a solid gas generant composition for the generation of gas and said second and third annular chambers each containing an individually associated cooling and filtering means, and

means to join said first and second structural components together at the mating surfaces of said first and third and said second and fourth concentric cylinders,

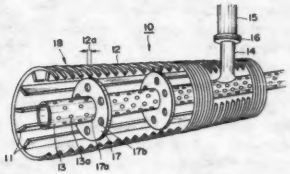
wherein said first and second subassemblies are structured so that for a given height and diameter of said first and second subassemblies there is provided in said first annular chamber a volume that extends out to the full inner diameter thereof, thus providing maximum volume for the containment therein of said solid gas generant composition and thereby enabling a reduction in the bulk and the weight of the gas generator housing construction for a given material from which the housing construction is fabricated.

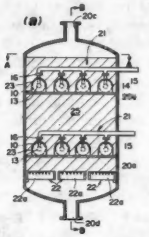
4,578,248

DISTRIBUTOR/COLLECTOR ASSEMBLY

Tadayoshi Nagaoka, Mihara, Japan, assignor to Nagaoka Kanaami Kabushiki Kaisha, Japan

Filed Nov. 3, 1982, Ser. No. 438,933
Claims priority, application Japan, Nov. 6, 1981, 56-117901
Int. Cl.[4] B01J *8/04*; B05B *1/14*
U.S. Cl. 422—310 **8 Claims**





1. A fluid distributor/collector assembly comprising:

a screen cylinder composed of a plurality of elongated support rods arranged cylindrically spaced apart with a suitable distance between adjacent rods and a wire screen member wound helically on said cylindrically arranged support rods;

at least one tube disposed within said screen cylinder and formed with a multiplicity of apertures for distributing or collecting fluid which flows through said wire screen member of said screen cylinder;

a plurality of support discs, each having an outer periphery, provided within said screen cylinder said support discs being positioned spaced apart along the axis of said screen cylinder in such a manner that said support rods of said screen cylinder are supported on the outer periphery of said support discs, each of said support discs having at least one tube opening in which said at least one tube is positioned thereby supporting said at least one tube within said screen cylinder in such a manner that a space is defined between said tube and said wire screen member of said screen cylinder;

each adjacent pair of support discs setting-off therebetween a portion of said at least one tube and defining space sections within said space between said at least one tube and said screen cylinder;

all of said tube portions having flow apertures therein;

flow communication means in each of said support discs for permitting fluid to flow between adjacent space sections; and pipe means connected to said at least one tube for supplying fluid to be distributed to said at least one tube or for removing fluid that has collected within said at least one tube.

4,578,249

PROCESS FOR RECOVERY OF URANIUM FROM WET PROCESS H_3PO_4

Viswanathan Srinivasan, and Matthew H. Hulbert, both of Terre Haute, Ind., assignors to International Minerals & Chemical Corp., Terre Haute, Ind.

Filed Sep. 2, 1983, Ser. No. 529,175
Int. Cl.[4] C01G *43/00*; C25B *1/00*
U.S. Cl. 423—10 7 Claims

1. A process for stripping hexavalent uranium from an organic solution containing it by contacting it with a stripping agent which is provided by phosphoric acid containing sufficient ferrous ion to reduce the uranium to the tetravalent state whereupon it passes into the stripping agent, subsequently oxidizing the tetravalent uranium again to the hexavalent state, extracting it with an organic solution, and recovering the uranium therefrom, comprising the step of passing the stripping agent containing ferric ions through the cathode chamber of an electrolytic cell having a cathode chamber and an anode chamber separated by a permeable membrane wherein the cathode is provided by a porous flow-through carbon electrode of high surface area that substantially excludes significant hydrogen production while applying a current density of 5–30 A/dm^2 to the cathode at a working potential between approximately 0 mV and −1400 mV versus a saturated calomel electrode thereby reducing ferric ion to ferrous state in the cathode chamber.

7. A process for stripping hexavalent uranium from an organic solution containing it by contacting it with a stripping agent which is provided by phosphoric acid containing sufficient ferrous ion to reduce the uranium to the tetravalent state whereupon it passes into the stripping agent, subsequently oxidizing the tetravalent uranium again to the hexavalent state, extracting it with an organic solution, and recovering the uranium therefrom, comprising the step of passing the stripping agent containing ferric ions through the cathode chamber of an electrolytic cell having a cathode chamber and an anode chamber separated by a permeable membrane wherein the cathode is provided by a roughened graphite carbon electrode of high surface area that substantially excludes significant hydrogen production while applying a current density of 5–30 A/dm^2 to the cathode at a working potential between approximately 0 mV and −1400 mV versus a saturated calomel electrode thereby reducing ferric ion to the ferrous state in the cathode chamber.

4,578,250

METHOD FOR THE RECOVERY OF PALLADIUM

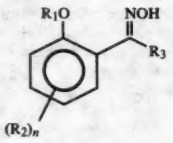
Jeffrey H. Dimmit, Williamsville; Michael Van Der Puy, and David S. Soriano, both of Cheektowaga, all of N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jul. 2, 1984, Ser. No. 626,956
Int. Cl.[4] C01G *55/00*
U.S. Cl. 423—22 27 Claims

1. A process for the separation and purification of palladium which is present in a platinum group metal-containing aqueous solution, said process comprising the steps of:

(a) adjusting the pH of the solution to 5 or less;

(b) contacting said acidic solution with one or more oxime compounds of the formula:



or a composition comprised of one or more of said compounds dissolved in an organic solvent, wherein:

n is an integer of from 1 to 4;

R_1 is alkyl, cycloalkyl, or aralkyl; and

R_2 is nitro, halogen, hydrogen or substituted or unsubstituted alkyl, alkoxy, aryloxy, cycloalkyl, aryl, aralkyl or alkaryl wherein permissible substituents are those which are inert to the process conditions; and

R_3 is alkyl, aryl, alkaryl, cycloalkyl, or aralkyl either unsubstituted or substituted with one or more of the above referenced permissible substituents; and

(c) removing from contact with said aqueous acidic solution the organic phase containing all or a part of the palladium originally present in said solution and said oxime compound; and

(d) extracting said palladium from the organic solvent with an aqueous ammonia solution.

4,578,251

REMOVAL OF CHROMIUM FROM COBALT

Joseph E. Ritsko, and Howard L. Acla, both of Towanda, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Apr. 1, 1985, Ser. No. 718,244
Int. Cl.[4] C01G *37/02, 51/00*
U.S. Cl. 423—55 5 Claims

1. A process for removing chromium from cobalt, said process comprising:

(a) contacting a chromium containing acidic cobalt chloride solution with an oxidizing agent to oxidize the cobalt contained therein;

(b) adjusting the pH of the resulting solution containing the oxidized cobalt and other metallic elements to a pH of from about 3.2 to about 5.5 with a base to form a first solid containing essentially all of the chromium as chromium hydroxide and a portion of the cobalt and a first liquor containing the balance of the cobalt;

(c) separating said first solid from said first liquor;

(d) heating said first solid at a sufficient temperature to remove essentially all of the water and form a second solid;

(e) contacting said second solid with sufficient water and ammonium hydroxide to form a slurry which is at a pH of greater than about 3.8, said slurry consisting essentially of a second liquor which contains essentially all of the cobalt which was present in said second solid and a third solid which contains essentially all of the chromium which was initially present in said acidic cobalt chloride solution; and

(f) separating said third solid from said third liquor.

4,578,252

METHOD FOR PREPARING ULTRA-PURE ZIRCONIUM AND HAFNIUM TETRAFLUORIDES

Ricardo C. Pastor, Manhattan Beach, and Morton Robinson, Agoura, both of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed May 14, 1985, Ser. No. 734,008
Int. Cl.[4] C01G *25/04, 27/04*
U.S. Cl. 423—76 17 Claims

1. In a method for separating iron impurities from an impure metal halide in which the impure metal halide is heated to a temperature sufficient to form a metal halide vapor, said vapor being separated from said impure metal halide and condensed to form purified metal halide having a reduced iron content, wherein the improvement comprises:

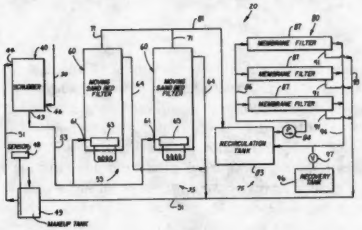
utilizing electromotive series displacement by contacting a melt containig the impure metal halide with a pure metal, said electromotive series displacement causing the plating out of 3d metal impurities.

4,578,253

METHODS OF AND APPARATUS FOR RECOVERING A CONSTITUENT OF A PROCESS EFFLUENT

Roger F. Gill, Dunwoody, and Pundi L. Narasimham, Norcross, both of Ga., assignors to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Jan. 31, 1984, Ser. No. 575,600
Int. Cl.[4] C03B 37/075
U.S. Cl. 423—87 19 Claims



1. A method of recovering a constituent of a process effluent such that the concentration of the constituent is at least a predetermined value, said method including the steps of:

contacting the process effluent with a liquid medium to provide a recirculating mixture which includes the liquid medium and particulates with at least the particulates including the constituent to be recovered;

flowing the mixture into a first filter to provide a filtrate and a residue;

flowing the residue from the first filter into a second filter to provide a filtrate and a residue which is recirculated through the second filter;

contacting subsequent process effluent with the filtrates; and

withdrawing a portion of the residue from the second filter when the concentration of the constituent is at least the predetermined value.

12. An apparatus for recovering a material from a process effluent such that a constituent of the material has at least a predetermined concentration, said apparatus comprising:

treating means for contacting the effluent with a liquid medium to provide a recirculating mixture which includes the liquid medium and particulates with at least the particulates including the constituent to be recovered;

first filter means connected to said treating means for removing from the mixture particulates above a first size to provide a filtrate which is substantially free of particulates larger than the first size and a residue;

second filter means connected to said first filter means for removing from the residue from said first filter means particulates above a second size that is smaller than the first size to provide a filtrate which is free of particulates larger than the second size and a residue which is recirculated through said second filter means;

means for directing the filtrates from said first and second filter means to said treating means to contact process effluent which is flowed into said treating means; and

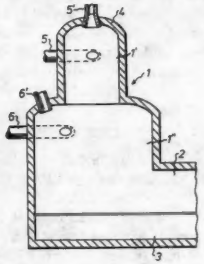
means rendered effective when the concentration of the constituent to be recovered is at a predetermined level for withdrawing a portion of the residue from said second filter means.

4,578,254

PROCESS FOR THE REFINING OF SULFIDIC CONCENTRATES WHICH CONTAIN ARSENIC, ANTIMONY AND BISMUTH

Rolf Malmström, Helsinki, Finland, assignor to RM Metal Consulting Ky, Helsinki, Finland

Filed Oct. 26, 1984, Ser. No. 665,380
Claims priority, application Finland, Oct. 27, 1983, 833940
Int. Cl.[4] C01B 27/00, 29/00
U.S. Cl. 423—88 6 Claims



1. A process for the refining of sulfidic concentrates which contain at least one element selected from the group consisting of arsenic, antimony and bismuth, wherein a suspension of a sulfidic concentrate and at least one gas selected from the group consisting of oxygen and oxygen-enriched air is introduced into the upper part of a reaction zone, in the lower part of which the direction of the gases is deflected sidewards in order to cause molten and solid particles traveling along with the gases to impinge against the surface of the melt below the reaction zone, comprising introducing, in order to form a molten or semi-solid phase, the concentrate, the gas into the reaction zone in such proportions that in the upper part of the reaction zone there is produced an atmosphere containing sulfur and sulfur dioxide and having a temperature above 1200° C. and a maximum oxygen pressure of 10^{-6} atm in order to volatilize arsenic, antimony or bismuth, and that during the same stage at least one gas selected from the group consisting of oxygen and oxygen-enriched air is fed into the lower part of the reaction zone in order to oxidize the concentrate to the desired metal concentration.

4,578,255

PURIFICATION OF BAYER PROCESS LIQUORS

William J. Roe, Aurora, Ill., and John T. Malito, Baton Rouge, La., assignors to Kaiser Aluminum Chemical Corporation, Oakland, Calif. and Nalco Chemical Company, Oak Brook, Ill.

Filed Dec. 27, 1984, Ser. No. 686,803
Int. Cl.[4] C01F 7/02, 7/06
U.S. Cl. 423—130 19 Claims

1. A process of removing humate-type organic impurities from Bayer process liquors and slurries containing dispersed solids therein, said solids generated either by the Bayer process or added thereto, which comprises introducing into the liquor a water-soluble, vinylic cationic polymetric quaternary ammonium salt in an amount sufficient to form at least a partial coating on the dispersed solids, maintaining the coated solids in contact with the liquor for a time sufficient to remove at least a portion of the humate present in the liquor through adhesion of the humate to the coating, removing the coated solids having the adhered humate thereon from the liquor and recovering a liquor having a significantly reduced humate content.

4,578,256

PROCESS FOR REMOVAL OF POISONOUS GASES

Hiroshi Nishino, Suita, and Toshio Aibe, Kashima, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Sep. 21, 1984, Ser. No. 653,093
Claims priority, application Japan, Sep. 27, 1983, 58-179870
Int. Cl.[4] B01D *53/02*
U.S. Cl. 423—210 6 Claims

1. A process of removing one or more hydrides selected from the group consisting of hydrides of As, B, P, Sb and Se from a gas containing oxygen and one or more of said hydrides, which comprises contacting said gas with an adsorbent comprising activated carbon having (1) iodine and/or one or more iodine compounds and/or (2) one or more members selected from the group consisting of sulfates and nitrates of NH_4, Ag, Al, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Cd, Pb and Sn supported thereon.

4,578,257

PROCESS FOR REMOVING SULFUR DIOXIDE FROM OFF-GAS

Yoshihiko Kudo, and Eiji Yoshida, both of Fukushima, Japan, assignors to Kureha Chemical Industry Co., Ltd, Japan

Continuation-in-part of Ser. No. 612,612, May 21, 1984, abandoned. This application Apr. 8, 1985, Ser. No. 720,811
Claims priority, application Japan, Dec. 13, 1983, 58-234841
Int. Cl.[4] C01B *17/00*
U.S. Cl. 423—243 3 Claims

1. In the off-gas desulfurization process which comprises contacting a sulfur dioxide-containing off-gas with an absorbing solution containing at least a sulfosuccinate formed between a tribasic acid anion represented by the formula

and a cation selected from Na^+, Mg^{++} and NH_4^+, a sulfate selected from sodium sulfate, magnesium sulfate and ammonium sulfate, and crystalline gypsum to absorb the sulfur dioxide for removal therefrom, and oxidizing the resulting absorbed solution with an oxygen-containing gas, while neutralizing the absorbed solution with limestone in order to fix the sulfur dioxide in the form of gypsum for separation, the improvement comprising adding maleic anhydride and limestone to the absorbed solution in which sulfur dioxide is absorbed during the residence time of the absorbed solution, and oxiding the resulting absorbed solution with an oxygen-containing gas to reproduce an absorbing solution therefrom.

4,578,258

PROCESS FOR THE PREPARATION OF CRYSTALLINE SHEET-TYPE ALKALI METAL SILICATES

Hans-Peter Rieck, Hofheim am Taunus, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 2, 1985, Ser. No. 688,184
Claims priority, application Fed. Rep. of Germany, Jan. 4, 1984, 3400132
Int. Cl.[4] C01B *33/20*
U.S. Cl. 423—325 8 Claims

1. A process for the preparation of a crystalline sheet-type alkali metal silicate in an aqueous medium, wherein an acidic compound is added to an amorphous alkali metal silicate, or an alkali metal silicate dissolved in water, having a molar ratio M_2O/SiO_2, where M represents an alkali metal, of 0.24 to 2.0, in an amount such that a molar ratio M_2O (unneutralized)-$/SiO_2$ of 0.05 to 0.239 is obtained, and the reaction mixture is kept at a reaction temperature of 70° to 250° C. until the sheet-type alkali metal silicate has crystallized out.

4,578,259

PROCESS FOR PREPARING A CRYSTALLINE ALUMINOSILICATE

Nobuyuki Morimoto; Kozo Takatsu, both of Sodegaura, and Michio Sugimoto, Ichihara, all of Japan, assignors to Research Association for Petroleum Alternatives Development, Tokyo, Japan

Filed Feb. 22, 1984, Ser. No. 582,529
Claims priority, application Japan, Mar. 7, 1983, 58-35926; Oct. 14, 1983, 58-190977
Int. Cl.[4] C01B *33/28*
U.S. Cl. 423—329 1 Claim

1. A process for preparing a crystalline aluminosilicate which has a composition represented by the general formula after being calcined in air at 500° C. as follows:

$$pM_{2/n}O.Al_2O_3.qSiO_2$$

wherein M represents at least one element selected from hydrogen, alkali metals, and alkaline earth metals, n represents the valence of M, and p and q each represent a molar ratio and are chosen within the ranges of $0.5 \leqq p \leqq 3.0$ and $5 \leqq q \leqq 500$, and has the X-ray diffraction patern set forth in Table 2 which comprises reacting an aqueous mixture containing (a) a silica source, (b) an alumina source, (c) an alkali metal and/or alkaline earth metal source, (d) at least one pyridine compound selected from the group consisting of pyridine, pyridinium chloride, methylpyridine, dimethylpyridine, ethylpyridine, trimethylpyridine and ethylmethylpyridine, and (e) at least one compound selected from the group consisting of methanol, ethanol, propanol, n-butanol, isopropanol, ethylene glycol, propylene glycol, dimethyl ether, diethyl ether, isopropylamine, morpholine, ethylenediamine, propylenediamine, phenylenediamine, monoethanolamine, monopropanolamine and diethanolamine, in the following ratios:

silica (SiO_2)/alumina (Al_2O_3)$\geqq$5
pyridine compound/silica=0.01 to 100
component (e)/silica=0.01 to 100
hydroxyl ion/silica=0.001 to 0.5 (excluding hydroxyl ions resulting from organic bases)
water/silica=5 to 1,000
alkali metal and/or alkaline earth metal/silica=0.01 to 3

at a temperature ranging between 100° and 300° C. till the crystalline aluminosilicate is formed.

4,578,260

METHOD FOR PURIFYING DIAMOND

Yutaka Kuroyama, Chita, and Masatada Araki, Handa, both of Japan, assignors to Nippon Oil and Fats Company Limited, Japan

Filed Apr. 24, 1985, Ser. No. 726,886
Claims priority, application Japan, May 11, 1984, 59-94197
Int. Cl.[4] C01B *31/06*
U.S. Cl. 423—446 1 Claim

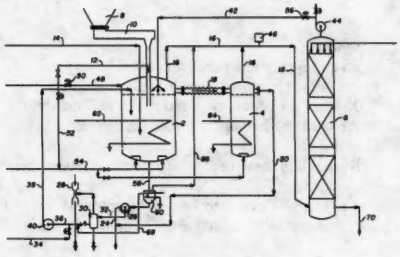
1. A method for purifying diamond, comprising heating a powdery mixture of diamond and graphite together with ammonium nitrate and at least one metal oxide selected from the group consisting of lead monoxide, trilead tetroxide, magnesium oxide and zinc oxide, to oxidize the graphite powder, and removing the oxidized graphite.

4,578,261

METHOD TO REDUCE THE POTENTIAL SALT CAKE CONTENT OF CHLORINE DIOXIDE GENERATOR SPENT ACIDS

Derek G. Lobley, Surrey, Canada, assignor to Multifibre Process Limited, British Columbia, Canada

Continuation-in-part of Ser. No. 510,459, Jul. 1, 1983, Pat. No. 4,486,399. This application Nov. 28, 1984, Ser. No. 675,627
The portion of the term of this patent subsequent to Dec. 4, 2001, has been disclaimed.
Int. Cl.[4] C01B *11/06*
U.S. Cl. 423—478 3 Claims



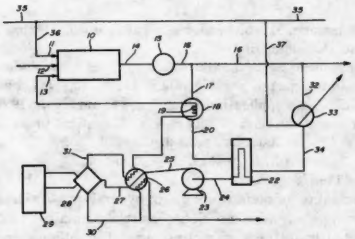
1. In a method of generating chlorine dioxide that comprises forming chloric acid by the action of sulphuric acid on a chlorate in a generator in the liquid phase and reducing the chloric acid to produce chlorine dioxide the improvement that comprises adding dilution water to dry chlorate prior to feeding the chlorate to the generator so that the chlorate is fed as a slurry.

4,578,262

LIQUID SULPHUR DIOXIDE MANUFACTURE

Gordon M. Cameron, North York, Canada, assignor to C-I-L Inc., North York, Canada

Filed Apr. 9, 1984, Ser. No. 598,004
Claims priority, application Canada, Apr. 29, 1983, 427116
Int. Cl.[4] C01B *17/98, 17/74, 17/54*
U.S. Cl. 423—522 1 Claim



1. In an existing sulphuric acid facility in which sulfur and dry air are fed to a sulphur dioxide generating furnace and generated sulphur dioxide-containing gas is fed to a waste heat boiler prior to a converter for the production of sulfur trioxide, an improved process permitting the coproduction of liquid sulphur dioxide, the improvement comprising

(a) feeding a recylcled depleted sulphur dioxide-gas stream to said sulphur dioxide generating furnace;

(b) taking off a minor portion of said generated sulphur dioxide-containing gas and subjecting said portion to liquefaction means at a temperature in the range −20° C. to −50° C. and at atmospheric pressure, to produce liquid sulphur dioxide and a depleted sulphur dioxide-gas stream;

(c) isolating said liquid sulphur dioxide;

(d) recycling said depleted sulphur dioxide-gas stream to said furnace, wherein said depleted sulphur dioxide-gas stream defines the stream of step (a);

(e) feeding a first dry air stream to said furnace to provide sufficent oxygen for combustion of said sulphur to sulphur dioxide; and

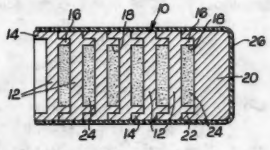
(f) feeding a second dry air stream, which directly bypasses the furnace and boiler, to said converter to provide sufficient oxygen for proper conversion of the remaining portion of said sulphur dioxide-containing gas to sulphur trioxide in said converter.

4,578,263

PHARMACEUTICAL PELLET

Derek J. Whitehead, Poynton, England, assignor to Castex Products Limited, Macclesfield, England

Filed Oct. 16, 1984, Ser. No. 661,417
Claims priority, application United Kingdom, Oct. 28, 1983, 8328916
Int. Cl.[4] A61J *3/00;* A61K *9/22*
U.S. Cl. 424—15 14 Claims



1. A pharmaceutical pellet of the kind intended to be administered to a ruminant to reside in its rumeno-reticular sac and release predetermined quantities of biologically-active substance over an extended period of time characterised in that it comprises an assembly consisting of a plurality of plates, of a magnesium alloy, axially spaced to define cavities therebetween, a biologically-active substance in each said cavity, and a retaining water-impermeable sleeve or sheath protecting the assembly from attack by rumen juices except at one axial end or both axial ends thereof.

4,578,264

RETARD FORM OF PHARMACEUTICALS WITH INSOLUBLE POROUS DIFFUSION COATINGS

Herbert Stricker, Ingelheim; Bernhard Freund, Gau-Algesheim; Heribert Harwalik; Karl L. Rominger, both of Ingelheim; Siegfried Darda; Volkmar Häselbarth, both of Ingelheim; Dietrich Arndts; Wolf D. Bechtel, both of Appenheim; Gerhard Bozler, Biberach; Rolf Brickl, Biberach, and Peter Gruber, Biberach, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

Division of Ser. No. 409,131, Aug. 18, 1982, Pat. No.
Claims priority, application Fed. Rep. of Germany, Jul. 15, 1978, 2831164; Aug. 19, 1978, 2836355; Aug. 19, 1978, 2836356; Aug. 19, 1978, 2836357; Aug. 19, 1978, 2836358; Aug. 19, 1978, 2836387; Aug. 19, 1978, 2836388; Aug. 19, 1978, 2836419; Aug. 19, 1978, 2836477; Feb. 19, 1979, 2905602
Int. Cl.[4] A61K *9/48, 9/52*
U.S. Cl. 424—37 13 Claims

1. A pharmaceutical dosage unit composition consisting essentially of a gelatin capsule containing (1) a disintegrating core comprising clonidine, said disintegrating core having a readily water-soluble coating, and (2) a plurality of non-disintegrating cores comprising clonidine, said non-disintegrating cores having a coating consisting of from 20 to 90 percent by

weight of a water-insoluble film former and from 10 to 80 percent by weight of a water-soluble polymer, the diameter of each of the disintegrating and non-disintegrating cores being at least about 5 mm.

4,578,265

DI-ENZYMATIC DENTIFRICE

Michael A. Pellico, and Robert E. Montgomery, both of Los Angeles, Calif., assignors to Laclede Professional Products, Inc., Gardena, Calif.

Filed Aug. 13, 1981, Ser. No. 292,633

The portion of the term of this patent subsequent to May 26, 1998, has been disclaimed.

Int. Cl.[4] A61K *7/28, 37/48*

U.S. Cl. 424—50 **17 Claims**

1. A di-enzymatic dentifrice containing from about 0.015 to about 0.6 millimole of oxidizable substrate and from about 0.5 to about 500 International Units of an oxidoreductase enzyme specific to such substrate for producing hydrogen peroxide upon oral application of said dentrifice and further containing from about 0.0001 to about 0.01 millimole of a thiocyanate salt and from about 0.05 to about 20 International Units of lactoperoxidase for interacting with hydrogen peroxide to produce a hypothiocyanate bacterial inhibitor, wherein each of the aforesaid quantities is based upon one gram of dentifrice; and limiting any water present in the dentifrice to an amount not more than about 10 wt. % based on the dentifrice weight to stabilize the dentifrice against the production of hydrogen peroxide prior to the oral application of the dentifrice.

4,578,266

SILICONE-BASED COSMETIC PRODUCTS CONTAINING PIGMENT

Marlene Tietjen, New York; Ivonne Brown, Roosevelt, and Ralph A. Macchio, Middletown, all of N.Y., assignors to Revlon, Inc., New York, N.Y.

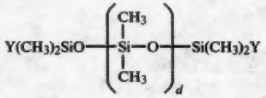
Filed Jul. 29, 1983, Ser. No. 518,498

Int. Cl.[4] A61K *7/021*

U.S. Cl. 424—63 **14 Claims**

1. An anhydrous homogeneous pigmented cosmetic product comprising

(a) 10 to 70 wt. % of dimethylpolysiloxane having the formula



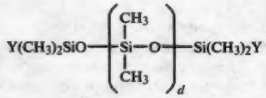
wherein both Y substituents are —CH_3, or both are —OH; and wherein d is sufficient to impart to the dimethylpolysiloxane a viscosity of 0.65 to 10^6 centistokes at 25° C.; and

(b) a coated pigment which consists essentially of finely divided particles of inorganic pigment whose surfaces are chemically bonded to, and physically completely coated by a polysiloxane which coating renders the particles hydrophobic; wherein said pigment is readily dispersible in component (a) without settling or segregating.

4. An anhydrous homogeneous pigmented cosmetic composition comprising

(a) 10 to 70 wt. % of a silicone component comprising

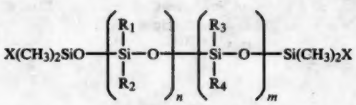
(1) dimethylpolysiloxane having the formula



wherein both Y substituents are —CH_3 or both are —OH, and wherein d is sufficient to impart to the dimethylpolysiloxane a viscosity of 0.65 to 10^6 centistokes at 25° C.; in a one phase mixture with one or more of

(2) organosilane having the formula $RSi(CH_3)_3$ wherein R is alkyl having 1 to 30 carbon atoms, phenyl or styryl;

(3) organopolysiloxane having the formula



wherein

R_1 and R_3 are independently alkyl having 1 to 30 carbon atoms, phenyl or styryl;

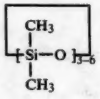
X is alkyl or alkyl-oxy and has 1 to 30 carbon atoms;

R_4 is alkyl having 1 to 30 carbon atoms, phenyl or styryl;

R_2 is alkyl having 2 to 30 carbon atoms, phenyl or styryl, or —$OSi(CH_3)_3$; and

n is 1 to 100, m is 0 to 100, and (n plus m) is 1 to 100; or

(4) cyclomethicone having the formula



provided that said composition contains at least about 10 wt. % of component (1); and

(b) a coated pigment which comprises finely divided particles of inorganic pigment whose surfaces are chemically bonded to and physically coated by a polysiloxane which coating renders the particles hydrophobic; wherein said pigment is readily dispersible in component (a) without settling or segregating.

4,578,267

SKIN CONDITIONING POLYMER CONTAINING ALKOXYLATED NITROGEN SALTS OF SULFONIC ACID

Ann B. Salamone, Marblehead, Mass., assignor to Morton Thiokol, Inc., Chicago, Ill.

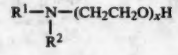
Continuation of Ser. No. 405,466, Aug. 5, 1982, abandoned, Continuation-in-part of Ser. No. 302,324, Sep. 15, 1984, Pat. No. 4,401,650. This application Dec. 7, 1984, Ser. No. 679,612

The portion of the term of this patent subsequent to Aug. 30, 2000, has been disclaimed.

Int. Cl.[4] A61K *31/74, 31/78*

U.S. Cl. 424—78 **16 Claims**

1. In a method of conditioning skin by applying to skin a skin conditioning composition which consists essentially of a member selected from the group consisting of emollients and humectants, the improvement comprising adding to said composition from 0.1 to 10 wt % of a homopolymer made from an ethylenically unsaturated addition polymerizable monomer, said monomer containing an alkoxylated nitrogen salt of sulfonic acid, said salt being derived from an ethoxylated amine having the following structure:



where,

R^1, R^2, =H,

alkyl (C_1–C_{30}), wherein, at least one of R_1 or R_2=alkyl (C_6–C_{30}),
aryl, $(CH_2CH_2O)_xH$, or
R^1–R^2=cycloalkylene,
and
x=1 to 50.

4,578,268

DIETHYLCARBAMAZINE RESINATE AND STYRYLPYRIDINIUM RESINATE-DIETHYLCARBAMAZINE RESINATE EDIBLE ANTHELMINTIC TABLETS FOR COMPANION ANIMALS

James M. Quinlan, Trenton, N.J., assignor to American Cyanamid Company, Stamford, Conn.

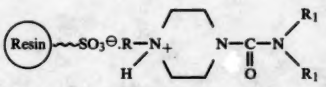
Continuation-in-part of Ser. No. 239,966, Mar. 3, 1983, Pat. No. 4,442,086, which is a continuation-in-part of Ser. No. 60,931, Jul. 26, 1979, abandoned. This application Feb. 16, 1984, Ser. No. 580,577

The portion of the term of this patent subsequent to Apr. 10, 2001, has been disclaimed.

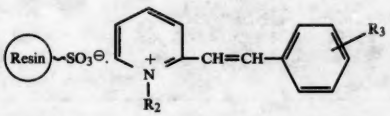
Int. Cl.[4] A61K *31/74*

U.S. Cl. 424—79 **9 Claims**

1. A palatable anthelmintic resinate composition comprising from greater than 5% to about 11% by weight of a resinated N,N-dialkylpiperazine carboxamide compound having the structural formula:



wherein R is hydrogen or alkyl C_1–C_6 and R_1 is alkyl C_1–C_5 and wherein the resin is a high capacity sulfonic cationic exchange resin of the polystyrene-divinylbenzene type having a particle size of less than 800μ; from greater than 7% to 16% by weight of a resinated styrylpyridinium compound having the structural formula:



wherein R_2 is alkyl C_1–C_4, R_3 is hydrogen or halogen and the resin is a high capacity sulfonic cationic exchange resin of the polystyrene-divinylbenzene type having a particle size of less than 800μ; 18% to 60% by weight of dessiccated liver; 0 to 40% by weight of Brewer's yeast; 23.95% to 31% by weight of microcrystalline cellulose, 0% to 7% by weight of stearic acid; and 0% to 0.05% by weight of sodium aluminum silicate or silicon dioxide.

4,578,269

IMMUNOGENIC PROTEIN OR PEPTIDE COMPLEX, METHOD OR PRODUCING SAID COMPLEX AND THE USE THEREOF AS AN IMMUNE STIMULANT AND AS A VACCINE

Bror Morein, Krokusvägen 14, S-175 74 Järfälla, Sweden

Filed Oct. 18, 1983, Ser. No. 543,032

Claims priority, application Sweden, Oct. 18, 1982, 8205892

Int. Cl.[4] C07G *7/00;* **A61K** *39/00*

U.S. Cl. 424—88 **8 Claims**

1. An immunogenic complex containing antigenic proteins or peptides with hydrophobic regions, characterized in that is is obtained by mixing at least one member selected from the group consisting of

(A) enveloped viruses, bacteria, mycoplasmas, parasites or animal cells containing amphiphatic proteins or peptides with hydrophilic and hydrophobic groups or such proteins or peptides produced by hybrid DNA-technique or molecules produced synthentically,

(B) hydrophilic proteins or peptides made amphiphatic by hydrophobic groups being coupled to them, which proteins or peptides derive from viruses, bacteria, mycoplasmas, parasites, animal cells or are synthesized or obtained by hybrid DNA technique, and

(C) amphiphatic proteins or peptides obtained by in accessible hydrophobic parts of hydrophilic proteins made accessible by chemical means, which proteins derive from the microorganisms or cells mentioned above or are obtained by hybrid DNA technique, or are synthesized,

with at least one solubilizing agent, whereby complexes are formed between amphiphatic antigenic proteins or peptides and the solubilizing agent, whereafter the amphiphatic antigenic proteins or peptides are separated from solubilizing agent in the presence of or are separated from the solubilizing agent and directly transferred to a solution containing at least one polar triterpensaponin with hydrophobic and hydrophilic regions in a concentration of at least the critical micellular concentration, by the mixture of viruses, bacteria, mycoplasmas, parasites, animal cells, proteins or peptides with the solubilizing agent(s) by one of the methods of

(a) being layered on top of a gradient containing solubilizing agent, which lies in turn over a gradient containing triterpensaponin and centrifuged, the proteinaceous fraction being isolated,

(b) the mixture of microoragnisms, cells, proteins or peptides, and the solubilizing agent being mixed with triterpensaponin and dialyzed or being layered directly on a gradient and centrifuged, whereafter the protein-containing top fraction is eollected, reacted with triterpensaponin and dialyzed against buffer,

(c) the mixture of microorganisms, animal cells, proteins or peptides and solubilizing agent or the proteinaceous top fraction obtained when the mixture of microoragnisms, animal cells, proteins or peptides and solubilizing agent solution is centrifuged through a gradient, being separated by electrophoresis, or

(d) being separated chromatographically from the solubilizing agent and collected in a solution containing the triterpensaponin, whereafter the protein complex obtained is concentrated, or purified, by lyophilization, vacuum dialysis or ultracentrifuging or is purified further by gradient centrifugation.

4,578,270

PROCESS FOR THE PREPARATION OF LYOPHILIZED, ADSORBED POLYVALENT VACCINES

Zoltan Csizer; Karoly Sikos; Laszlo Bacskai; Istvan Joo; Eleonora Niedermayer; Lajos Rethy, and Jozsef Zaidai, all of Budapest, Hungary, assignors to Human Oltoanyagtermelo Es Kutato Intezet, Budapest, Hungary

Filed Feb. 22, 1984, Ser. No. 582,432

Claims priority, application Hungary, Feb. 22, 1983, 609/83

Int. Cl.[4] A61K *39/02*

U.S. Cl. 424—92 **10 Claims**

1. A process for the preparation of lyophilized, adsorbed, polyvalent vaccine against tetanus, diphtheria and pertussis, which comprises the steps of:

(a) concentrating tetanus, diphtheria, and pertussis antigens to a value of 5 to 15 doses of vaccine per 3 ml;

(b) concentrating an insoluble adsorbent carrier selected from the group consisting of aluminum hydroxide gel and aluminum phosphate so that 1.75 to 3.5 mg of adsorbent carrier are employed per dose of vaccine;

(c) adsorbing the tetanus, diphtheria, and pertussis antigens concentrated in step (a), separately or together, on the insoluble adsorbent carrier concentrated in step (b), at a pH of 3 to 6, which is not lower than the value of the isoelectric point of any of the antigens and which does not

exceed a pH value at which more than 15% of the antigens adsorbed at the pH value of the isoelectric point are eluated;

(d) adjusting the pH value to 5 to 6: and

(e) lyophilizing the mixture in the presence of a protective material selected from the group consisting of proteins, polypeptides and polysaccharides.

4,578,271

BIOLOGICALLY ACTIVE WS 6049 SUBSTANCES, A PROCESS FOR THE PRODUCTION THEREOF AND THEIR PHARMACEUTICAL COMPOSITIONS

Sumio Kiyoto, Urawa; Motoaki Nishikawa, Toyonaka; Morita Iwami, Takarazuka; Hiroshi Terano, Toyonaka, and Masanobu Kohsaka, Sakai, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed May 3, 1983, Ser. No. 491,170

Claims priority, application United Kingdom, May 24, 1982, 8215123

Int. Cl.[4] A61K *35/00;* **C12P** *13/00, 1/06;* **C12R** *1/03*

U.S. Cl. 424—117 **8 Claims**

1. A WS 6049 substance selected from the group consisting of WS 6049-A substance and WS 6049-B substance, wherein

(i) the WS 6049-A substance has the following properties:

(1) Form and color: Colorless powder

(2) Color reaction:

Positive: in Dragendorff reaction, Ehrlich's reaction and cerium sulfate reaction

Negative: in ninhydrin reaction

(3) Solubility

Soluble: in methanol, acetone, chloroform

Slightly soluble: diethyl ether

Insoluble: in hexane, water

(4) Melting point: 150° C. (dec.)

(5) Specific rotation: $[\alpha]_D^{25} = -208 \uparrow$ (C=1.0, $CHCl_3$)

(6) Ultraviolet absorption spectrum:

$$\lambda_{max}^{CH_3OH} = 252 \text{ nm } (E_{1cm}^{1\%} = 560)$$
$$= 280 \text{ nm } (E_{1cm}^{1\%} = 370)$$
$$= 320 \text{ nm } (E_{1cm}^{1\%} = 220)$$

$\lambda_{max}^{CH_3OH+HCl}$=252, 280, 320 nm

$\lambda_{max}^{CH_3OH+NaOH}$=250, 280, ca310 (sh.)nm

(7) Infrared absorption spectrum:

$\nu_{max}^{CHCl_3}$=3450, 3350, 3250, 2960, 2920, 1725, 1675, 1610, 1595, 1520, 1465, 1450, 1405, 1370, 1350, 1310, 1250, 1180, 1155, 1115, 1075, 1020, 985, 955, 905, 805 cm^{-1}

(8) Elementary analysis:

C: 52.03%, H: 5.71%, N: 4.15%, S: 9.86%

(9) Thin layer chromatography:

Developing		
Stationary Phase	Solvent	Rf value
Silica gel sheet	chloroform: methanol (10:1)(v/v)	0.59
	chloroform: acetone (1:1)(v/v)	0.33

(10) Molecular weight:

FD Mass: m/z 1333 (M^++Na)

FABQ MS: m/z 1311 (M^++1)

Gel permeation chromatography: 1100–1200

(11) ^{13}C Nuclear magnetic resonance spectrum ($CDCl_3$):

δ (ppm): 13.9, 14.6, 16.7, 17.6, 19.9, 22.8, 29.1, 34.0, 35.2, 39.6, 42.3, 55.8, 56.1, 56.2, 56.2, 60.3, 61.7, 68.4, 69.0, 69.3, 69.8, 70.5, 72.0, 75.9, 76.1, 77.2, 77.3, 83.2, 86.3, 88.5, 90.7, 97.3, 98.6, 98.9, 99.6, 99.7, 103.9, 107.8, 112.7, 123.2, 125.0, 130.0, 131.1, 136.8, 144.2, 146.6, 154.0, 154.6, 160.9, 166.6, 192.4, as shown in FIG. 1 of the accompanying drawing,

(12) ^1H Nuclear magnetic resonance spectrum ($CDCl_3$):

δ (ppm): 8.57 (1H, s), 7,.48 (1H, s), 6.6 (1H, d.d), 6.2 (1H, d, J=1.6 Hz), 618 (1H, br.s), 5.93 (1H, d, J=9.6 Hz), 5.83 (1H, d.d J=9.6, 1.6 Hz), 5.7 (1H, d, J=2 Hz), 5.5 (1H, m), 5.48 (1H, d, J=2.3 Hz), 5.43 (1H, br.s), 4.97 (1H, d), 4.7 (2H, m), 4.56 (1H, d, J=2.3 Hz), 4.23 (1H, s), 4.2 to 3.6 (10 to 14H), 3.97 (3H, s), 3.88 (3H, s), 3.79 (3H, s), 3.5 (2H, m), 3.43 (3H, s), 2.77 (1H, s), 2.7 (2H, m), 2.52 (3H, s), 2.5 (1H, m), 2.4 to 2.25 (3H, m), 2.17 (1H, s), 2.12 (3H, s), 2.07 (1H, m), 1.77 (2H, s), 1.5 (2H, m), 1.41 (3H, d, J=6 Hz), 1.35 (3H, d, J=6 Hz), 1.32 (3H, d, J=6 Hz), 1.2 (4H, m), as shown in FIG. 2 of the accompanying drawing, and

(ii) the WS 6049-B substance has the following properties:

(1) Form and color: Colorless powder

(2) Color reaction:

Positive: in Dragendorff reaction, Ehrlich's reaction and cerium sulfate reaction

Negative: in ninhydrin reaction

(3) Solubility:

Soluble: in methanol, acetone, chloroform

Slightly soluble: in diethyl ether

Insoluble: in hexane

(4) Melting point: 145° C. (dec.),

(5) Specific rotation: $[\alpha]_D^{25} = -201 \cup$ (c=1.0, $CHCl_3$)

(6) Ultraviolet absorption spectrum:

$$\lambda_{max}^{CH_3OH} = 253 \text{ nm } (E_{1cm}^{1\%} = 620)$$
$$= 280 \text{ nm } (E_{1cm}^{1\%} = 450)$$
$$= 320 \text{ nm } (E_{1cm}^{1\%} = 250)$$

$\lambda_{max}^{CH_3OH+HCl}$=253, 280, 320 nm

$\lambda_{max}^{CH_3OH+NaOH}$=250, 282, 310 (sh.) nm

(7) Infrared absorption spectrum:

$\nu_{max}^{CHCl_3}$=3450, 3350, 2990, 2920, 1725, 1675, 1610, 1595, 1520, 1465, 1450, 1405, 1370, 1350, 1310, 1250, 1180, 1155, 1115, 1070, 1020, 985, 955, 905, 880, 850 cm^{-1}

(8) Elementary analysis:

C: 51.58%, H: 5.75%, N: 4.27%, S: 9.80%

(9) Thin layer chromatography:

Developing		
Stationary Phase	Solvent	Rf value
Silica gel sheet	chloroform: methanol (10:1)(v/v)	0.53
	chloroform: acetone (1:1)(v/v)	0.18

(10) Molecular weight: 1100 to 1200 by Gel permeation chromatography [:1100 to 1200]

(11) ^{13}C Nuclear magnetic resonance spectrum ($CDCl_3$):

δ (ppm): 13.8, 16.7, 17.6, 19.8, 22.7, 29.1, 33.9, 34.1, 35.2, 39.5, 52.8, 55.8, 56.1, 56.3, 61.0, 61.5, 64.6, 66.7, 68.4, 69.0, 69.3, 69.8, 70.4, 71.9, 75.9, 76.2, 76.7, 77.2, 77.3, 77.6, 83.2, 86.6, 88.3, 90.7, 97.3, 98.6, 99.0, 99.6, 99.7, 103.9, 107.8, 112.7, 123.2, 124.9, 129.8, 131.0, 136.8, 144.2, 146.3, 154.0, 154.6, 160.9, 166.6, 192.4, as shown in FIG. 3 of the accompanying drawing,

(12) H Nuclear magnetic resonance spectrum ($CDCl_3$):

δ (ppm): 11.75 (1H, s), 8.57 (1H, s), 7.48 (1H, s), 6.6 (1H, d.d.), 6.24 (1H, d, J=1.3 Hz), 6.18 (1H, br.s), 5.93 (1H, d, J=9.2 Hz), 5.83 (1H, d.d, J=9 Hz and 1.3 Hz), 5.70 (1H, br.d), 5.5 (1H, m), 5.47 (1H, d, J=2.3 Hz), 5.42 (1H, br.s), 4.98 (1H, d, J=9 Hz), 4.7 to 4.6 (2H, m), 4.56 (1H, d, J=2.3 Hz), 4.24 (1H, s), 4.15 to 3.4 (12 to 18H),

3.97 (3H, s), 3.88 (3H, s), 3.79 (3H, s), 3.42 (3H, s), 2.52 (3H, s), 2.6 to 2.4 (2H, m), 2.4 to 2.2 (7 to 8H), 2.12 (3H, s), 2.2 to 2.0 (2H, m), 1.5 (2H, m), 1.4 (3H, d, J=6 Hz), 1.35 (3H, d, J=6 Hz), 1.33 (3H, d, J=6 Hz), as shown in FIG. 4 of the accompanying drawing.

4,578,272

PREPARING YEAST BAKERY PRODUCT FLAVORS

Hideo Tomomatsu, Crystal Lake, Ill., assignor to Quaker Oats Company, Chicago, Ill.

Continuation-in-part of Ser. No. 242,883, Mar. 12, 1981, abandoned. This application May 17, 1985, Ser. No. 735,275

Int. Cl.[4] A21D *2/00*

U.S. Cl. 426—18 **13 Claims**

1. A method of preparing a yeast bread flavor composition suitable for indefinite storage, said method including the steps of mixing active breadmaking yeast with an aqueous nutrient solution of not more than about 0.5% sugar and allowing said mixture to react at a temperature of about 35°–40° C. for a period of time sufficient to form a solution of yeast enzymes, removing the yeast cells from the solution, mixing said yeast enzyme solution with a breadmaking flour, and permitting a reaction of said yeast enzyme solution and said flour to take place at about 35°–40° C. for a time sufficient to create reaction products which include a bread flavor solution portion and a spent flour portion, said reaction products being adapted for indefinite storage when dried.

4,578,273

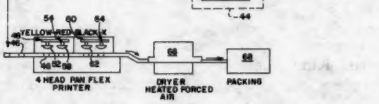
PRINTING OF FOODS

George J. Krubert, Niles, Ill., assignor to Keebler Company, Elmhurst, Ill.

Filed Apr. 7, 1981, Ser. No. 251,869

Int. Cl.[4] A23G *3/00;* **A21D** *13/08;* **A23P** *1/08;* **A23L** *1/275*

U.S. Cl. 426—87 **17 Claims**



1. A method of forming a printed food product comprising the steps of:

forming an icing mixture having a specific gravity of between 1.0 and 2.5,

shaping said icing mixture to have a surface,

drying said icing mixture to form a hard, non-porous icing surface,

transfer printing at least one edible ink to said hard dried surface of said icing, and

drying said ink.

10. A printed food product comprising:

a dried, hard, non-porous icing having a surface dried from an icing mixture having a specific gravity of between 1.0 and 2.5 before drying, and at least one edible ink transfer printed on said surface.

4,578,274

PROCESS FOR PREPARING GRANULAR FOOD PRODUCTS

Ko Sugisawa, Nara; Masaru Shibuki, Kyoto; Imayoshi Imada, Nara; Jun Katada, Nishinomiya; Yozo Yamamoto, Osaka; Setsuo Nakajima, Osaka; Toshio Kishi, Osaka, and Shozo Sugano, Osaka, all of Japan, assignors to House Food Industrial Co., Ltd., Tokyo, Japan

Filed Apr. 4, 1984, Ser. No. 596,774

Claims priority, application Japan, Jan. 10, 1984, 59-1358

Int. Cl.[4] A23L *1/216*

U.S. Cl. 426—96 **12 Claims**

1. A process for preparing a granular food product comprising the steps of:

(a) thorough admixing by continuous agitation one or more food material powders and a binder having a melting point in the range of 30° to 130° C. and selected from the group consisting of (1) the solid fat group consisting of beef tallow, lard, hardened palm oil, corn oil, bean oil, rape seed oil, and salad oil, (2) the wax group consisting of spermaceti, palm wax and beeswax and (3) sugar such as maltose in a mixing ratio in the range of 50–97 to 50–3 by weight percent of said food material powder to said binder at a temperatre below the melting point of the binder:

(b) dry-heating the mixture to a temperature above the melting point of the binder under continuous agitation to render the binder into a molten state to thereby bind the food material powder and binder, and;

(c) cooling said mixture mixture to a temperature below the melting point of the binder under continuous agitation or in a flow condition so as to granulate the mixture while solidifying the bond between the food material powder binder.

4,578,275

DATE PROCESSING

Henry C. Spanier, West Milford, N.J., assignor to Nabisco Brands, Inc., Parsippany, N.J.

Filed Oct. 21, 1983, Ser. No. 544,182

Int. Cl.[4] A23L *1/212*

U.S. Cl. 426—302 **13 Claims**

1. Process for treating light-colored, sucrose-type dates grown domestically to impart thereto the darker appearance, the flavor, the soft-chewy texture and the shelf-stability of imported invert sugar-type dates grown in the Middle East region comprising:

(a) applying to the domestic dates a coating of a liquefied composition containing water and an effective amount of at least one saccharide sugar sweetening agent;

(b) steaming the domestic dates containing the liquefied coating at a temperature and for a period of time which are sufficient to darken the coated domestic dates to substantially the same darkness as that of imported dates; and

(c) drying the steamed, coated domestic dates to provide shelf-stable, non-expanded treated dates, the size and shape of the shelf-stable, treated dates being substantially the same as the size and shape of the starting domestic dates, and said process not including any step or steps wherein there is expansion of the dates being treated from the original size of the untreated dates.

4,578,276

FROZEN WHIPPED CREAM

Robert G. Morley, 948 Cabot Ct., Stone Mountain, Ga. 30083

Filed Feb. 27, 1985, Ser. No. 705,952

Int. Cl.[4] A23C *13/12;* **A23G** *9/04*

U.S. Cl. 426—565 **7 Claims**

1. A process for preparing stabilized frozen whipped cream comprising the steps of:

(a) whipping whipping cream into whipped cream having stiff peaks with an air cell structure;

(b) incorporating a mixture of dry sweeteners, a blocking

agent, and a water binding stabilizing gum into the whipped cream at low speed to avoid overwhipping of the whipped cream;

(c) blending a warm solution at about 100° F. of thermoreversible gelling agent with the whipped cream and mixture of sweeteners, blocking agent, and water binding stabilizing gum to produce a homogeneous mass wherein the blocking agent, the water binding stabilizing gum, and the thermoreversible gelling agent strengthen the air cell structure of the frozen whipped cream so that upon thawing the air cell structure does not break down resulting in loss of aeration and seepage of serum; and

(d) freezing the homogeneous mass at or below 0° F.

4,578,277

1(7)-P-MENTHEN-9-AL AND ITS UTILIZATION AS PERFUMING AND FLAVORING INGREDIENT

Anthony F. Morris, Gingins; Francois Delay, Carouge; Fritz Gautschi, Commugny; Alan F. Thomas, Borex; Wolfgang K. Giersch, Bernex, and André Boschung, Gilly, all of Switzerland, assignors to Firmenich SA, Geneva, Switzerland

Division of Ser. No. 470,436, Feb. 28, 1983, Pat. No. 4,543,429.
This application May 3, 1985, Ser. No. 730,012
Claims priority, application Switzerland, Apr. 15, 1982, 2280/82
Int. Cl.[4] A23L *1/226;* A61K *7/46*
U.S. Cl. 426—538 3 Claims

1. A perfuming or a flavouring composition which comprises having added thereto 1(7)-p-menthen-9-al as active ingredient.

4,578,278

LIGHTER FOODSTUFFS AND METHOD FOR PREPARATION OF SUCH PRODUCTS

Claude Giddey, Geneva, and Georges Dove, Carouge, both of Switzerland, assignors to Battelle Memorial Institute, Geneva, Switzerland

Filed Jul. 30, 1984, Ser. No. 635,594
Claims priority, application Switzerland, Aug. 2, 1983, 4192/83
Int. Cl.[4] A23L *1/24, 1/32*
U.S. Cl. 426—605 9 Claims

1. An aerated mayonnaise type foodstuff comprising a foam of microbubbles of gas or air in an oil-in-water emulsion of oil, water, egg yolk, vinegar, seasoning, a gelifying stabilizer and coagulated whipped egg white.

4,578,279

INSPECTION OF MULTILAYER CERAMIC CIRCUIT MODULES BY ELECTRICAL INSPECTION OF UNFIRED GREEN SHEETS

Arthur R. Zingher, Elmsford, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

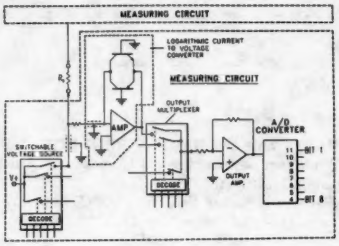
Division of Ser. No. 267,272, May 26, 1981, Pat. No. 4,443,278.
This application Feb. 16, 1984, Ser. No. 580,586
Int. Cl.[4] G01R *31/02*
U.S. Cl. 427—10 12 Claims

1. In a method of manufacture of ceramic electronic substrates comprising,

applying a paste to a number of unfired ceramic sheets,

said paste being applied in a manner adapted to form ulimately electrically conductive patterns after firing,

the improvement comprising electrically inspecting at least one of said ceramic sheets with an electrical input applied



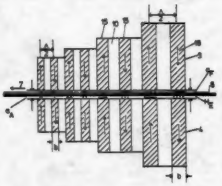
directly to said sheets prior to the step of firing of said sheets.

4,578,280

PROCESS FOR THE PRODUCTION OF A MAGNETIC RECORDING MATERIAL WITH PERPENDICULAR ORIENTATION

Joachim Greiner, Ebenhausen, and Burkhard Nippe, Munich, both of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 27, 1984, Ser. No. 583,727
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1983, 3308052
Int. Cl.[4] B05D *3/14*
U.S. Cl. 427—47 13 Claims



1. A process for the production of a magnetic recording material having at least one layer comprised of magnetically anistropic pigments dispersed in a binder comprising the steps of

casting a magnetic dispersion of pigments in liquid suspension in a layer on a support,

subjecting said magnetic dispersion in liquid suspension to an external magnetic field positioned longitudinally of said cast layer and which acts in a direction substantially perpendicular of the cast layer,

displacing the cast layer and magnetic field longitudinally with respect to each other,

repeatedly alternating the orientation of said field by 180° and reducing the field strength in the direction of casting of the layer

so that the pigments turn with the preferential axis thereof into the perpendicular axis of the layer and form spatially small regions of reduced stray field energy as a result of the demagnetization or obilteration effect and

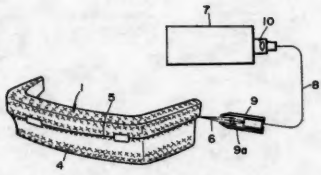
the pigments are subsequently fixed by drying.

4,578,281

METHOD OF PARTIALLY PAINTING AN ARTICLE USING LASER MASKING TECHNIQUE

Hiroo Ebisawa; Iwao Maruyama; Masao Fukuda, and Shigeo Miyamoto, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 25, 1985, Ser. No. 727,403
Claims priority, application Japan, Apr. 27, 1984, 59-85992
Int. Cl.[4] B05D *3/06, 1/32;* B65B *33/00*
U.S. Cl. 427—53.1 17 Claims



1. A method of partially painting a workpiece, comprising the steps of:

coating a surface of the workpiece with strippable paint containing powder of a substantially high light energy absorptivity;

drying the coated strippable paint into a strippable film on the workpiece surface;

applying a laser beam to said strippable film along a prescribed cutting line so as to cut said strippable film;

peeling off a portion of said strippable film corresponding to a first area of the workpiece surface to be painted, while leaving the remaining portion of said strippable film adhering on a second area of the workpiece surface to remain unpainted, thereby masking said workpiece; and

painting said first area with paint to form a final paint coating.

4,578,282

COMPOSITION FOR DIAGNOSTIC REAGENTS

James S. Harrison, 12 Sioux La., Ringwood, N.J. 07456

Division of Ser. No. 345,589, Feb. 4, 1982, Pat. No. 4,493,821.
This application Jan. 4, 1985, Ser. No. 688,975
Int. Cl.[4] G01N *33/545, 33/552;* C09Q *15/04*
U.S. Cl. 422—57 18 Claims

1. A diagnostic composition which comprises

(a) a proteinaceous substance which is reactive in a diagnostic immunological reaction; and

(b) as a principal active preservative component for said proteinaceous substance, a mixture of from about 10 to about 75% by weight of pyrrolid-2-one, from about 10 to about 50% by weight of polyol, from about 1 to about 20% by weight of a urea and from about 1 to about 10% by weight of a zinc salt of a nonoxidizing organic or inorganic acid, the relative percentages of said preservative component ingredients being selected from within the respective ranges so that their sum is 100% of said mixture.

4,578,283

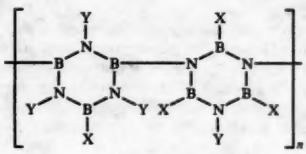
POLYMERIC BORON NITROGEN DOPANT

Stephen W. Kirtley, Sunnyvale, Calif., and George S. Wooster, Hamburg, N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 421,945, Sep. 23, 1982, abandoned. This application Oct. 9, 1984, Ser. No. 659,119
Int. Cl.[4] C08G *79/08*
U.S. Cl. 427—85 4 Claims

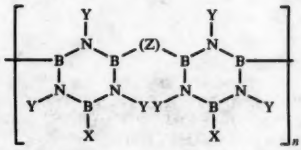
1. A method of applying a polymeric composition to semiconductor substrates comprising dispensing a polymer containing from 1 to 20 percent by weight in a volatile organic solvent of a homogeneous glassy polymer at least a substantial part of the backbone of which is selected from:

(a) polymers with borazine rings linked directly between a boron in one ring and a nitrogen atom in the adjacent ring of the formula



and

(b) polymers with borazine rings linked via other groups Z of the formula



wherein X and Y locate the substituents on the ring boron and nitrogen atoms and Z is selected from the group consisting of —N(R)—, —O—, —N(R)—R[1]—N(R)—, and —R—, wherein R and R[1] denote organic radicals of 1 to 10 carbon atoms and X and Y are radicals selected from the group consisting of hydrogen, alkyl radicals of 1–8 carbon atoms, unsubstituted aromatic, alkyl halogen, hydroxy and amino substituted aromatics, heterocyclic aromatics, 1–6 carbon alkyl substituted heterocyclic aromatic, amino, alkoxy and halogen radicals; rotating the wafer at 2,000–10,000 rpm, to produce a thin film, of the order of 100–7000 Å of the polymer on the substrate; heating the treated wafer in a diffusion furnace for 0.5–2.0 hours at 850° C.–1100° C. in a nitrogen ambient; deglazing the heated substrate in HF; and heating the substrate at elevated temperature of 1050° C.–1200° C. for 1–2 hours under an atmosphere selected from oxygen, wet oxygen and nitrogen ambients and combinations thereof.

4,578,284

POLYAMIDE SHEATHED OPTICAL WAVEGUIDE FIBERS

Werner Gruber, Korschenbroich, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Aug. 1, 1985, Ser. No. 761,642
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1984, 3430008
Int. Cl.[4] B05D *5/06;* C03C *25/02*
U.S. Cl. 427—163 17 Claims

1. A method for manufacturing sheathed high tensile strength optical waveguides having drawn glass fiber optical cores comprising:

passing said cores through a molten thermoplastic polyamide to form an adhering coating; and

cooling said coating to form a uniform sheath;

said polyamide sheath being flexible over a temperature range of −40° C. to +80° C.; and said polyamide containing dimeric fatty acid as one of its monomer components, and having a glass transition temperature below −10° C.

4,578,285

INK JET PRINTING SUBSTRATE

Michael S. Viola, Burlington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 475,896, Mar. 16, 1983, abandoned. This application Oct. 15, 1984, Ser. No. 661,119

Int. Cl.⁴ B41M *5/00*

U.S. Cl. 427—209 **18 Claims**

1. A transparent ink jet printing substrate which comprises a transparent support carrying an ink receptive layer consisting essentially of at least 70% by weight of polyurethane and 5 to 30% by weight of a polymer selected from the group consisting of polyvinylpyrrolidone, polyvinylpyrrolidine/vinyl acetate compolymer, poly(ethylene oxide), gelatin and polyacrylic acid.

4,578,286

ELECTRICALLY CONDUCTIVE COATING COMPOSITION OF A CHLOROSULFONATED POLYETHYLENE

Joseph A. Vasta, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 578,031, Feb. 2, 1984, Pat. No. 4,513,060. This application Dec. 28, 1984, Ser. No. 687,363

The portion of the term of this patent subsequent to Apr. 23, 2002, has been disclaimed.

Int. Cl.⁴ B32B *5/00*; **H01B** *1/06*

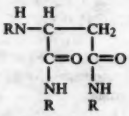
U.S. Cl. 427—327 **24 Claims**

1. A coating composition comprising 10–80% by weight of binder and 20–90% by weight of an organic solvent; wherein the binder consists essentially of about

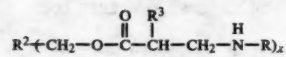
(1) 35–90% by weight, based on the weight of the binder, of a chlorosulfonated polyethylene having a weight average molecular weight of about 75,000 to 300,000 determined by gel permeation chromatography and having a chlorine content of 20 to 50% by weight and a sulfur content of 0.7 to 2.0% by weight;

(2) 7–60% by weight, based on the weight of the binder, of an epoxy resin;

(3) 3–20% by weight, based on the weight of the binder, of a polyamine curing agent selected from the group consisting of



or



where R is R_1NH_2 and R^1 is an aliphatic or cycloaliphatic radical; R^2 is C or a hydrocarbon group, R^3 is H or CH_3, when x is 3 R^2 is a hydrocarbon group and when x is 4 R^2 is C;

wherein the coating composition contains electrically conductive pigments in a pigment to binder weight ratio of about 50/100 to 300/100 and a dry film of the coating composition 25 microns thick has an electrical resistance of about 1–50 ohms.

4,578,287

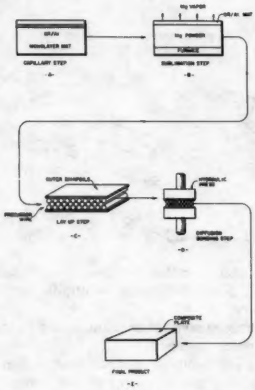
PROCESS FOR PRODUCING GRAPHITE FIBER/ALUMINUM-MAGNESIUM MATRIX COMPOSITES

Amarnath P. Divecha, Falls Church; Subhash D. Karmarkar, Great Falls, both of Va., and John V. Foltz, Camp Spring, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 9, 1984, Ser. No. 658,930

Int. Cl.⁴ C23C *16/06*

U.S. Cl. 427—250 **7 Claims**



1. A method of preparing a graphite fiber/aluminum-magnesium matrix composite comprising the following steps in order:

(1) exposing a precursor composite mat of graphite fibers which have been ion-plated with aluminum to a liquid organic compound selected from the group consisting of methylene chloride, toluene, benzene, and heptane;

(2) allowing the graphite fibers to absorb the liquid organic compound by capillary action until the graphite fibers expand in volume and become straight;

(3) removing the excess liquid organic compound from the surface of the graphite fibers;

(4) using magnesium vapor to coat the aluminum ion-plated graphite fibers with magnesium; and

(5) densifying the resulting graphite fiber/aluminum-magnesium matrix composite.

4,578,288

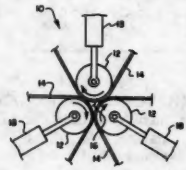
WEB COATING METHOD AND APPARATUS

Donald W. Lare, Greenville, and Thanh Van Nguyen, Painesville, both of Ohio, assignors to Avery International Corporation, Pasadena, Calif.

Filed Mar. 11, 1985, Ser. No. 710,330

Int. Cl.⁴ B05D *1/18, 3/12*; **B05C** *3/00, 11/02*

U.S. Cl. 427—365 **18 Claims**



1. A method of coating a passing web with a coating composition, comprising the steps of:

providing an array of at least three parallel rolls;

entraining the passing web partially around a first of the rolls;

constraining the array of rolls so that each respective roll, or any web means entrained thereon, is held against the two adjacent rolls or any web means entrained thereon, to form an elongated chamber surrounded by said array of rolls;

feeding a coating composition to said chamber;

rotating said first roll to move said passing web into said chamber between said first roll and a second roll which is one of the two rolls adjacent the first roll, and to move said passing web out of said chamber between said first roll and a third roll which is also one of the two rolls adjacent the first roll; and

rotating said third roll to move the surface thereof, and any web means entrained thereon, in a countermoving direction relative to said passing web as it exits said chamber, whereby the passing web is bathed in the coating composition while in the chamber and encounters a countermoving roll or web surface as it exits the chamber.

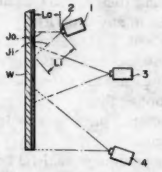
10. Apparatus for coating a passing web with a coating composition comprising an array of at least three parallel rolls, said passing web being entrained partially around a first of the rolls, means constraining the array of rolls so that each respective roll, or any web means entrained thereon, is held against the two adjacent rolls, or any web means entrained thereon, to form an elongated chamber surrounded by said array of rolls, means for feeding a coating composition to said chamber, means for rotating said first roll to move said passing web into said chamber between said first roll and a second roll which is one of the two rolls adjacent the first roll, and to move said passing web out of said chamber between said first roll and a third roll which is also one of the two rolls adjacent the first roll, and means for rotating said third roll to move the surface thereof, and any web means entrained thereon, in a countermoving direction relative to said passing web as it exits said chamber, whereby the passing web is bathed in the coating composition while in the chamber and encounters a countermoving roll or web surface as it exits the chamber.

4,578,289
Patent Not Issued For This Number

4,578,290
METHOD OF AND APPARATUS FOR COATING

Koichi Komon, Suzuka; Siro Ito, Kawasaki, and Shuichi Seino, Hirakata, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 19, 1984, Ser. No. 673,178
Claims priority, application Japan, Mar. 2, 1984, 59-39986
Int. Cl.[4] B05D *1/02*
U.S. Cl. 427—421 **8 Claims**



1. A method of producing a film of spray coating sharply defined in contour, comprising supporting the nozzle of an airless-type spray gun that is disposed for spraying on an outermost end of a surface to be coated in an axially inclined position such that the external ridge-line of the fan-shaped spray discharged from said nozzle is almost perpendicular with or slightly inwardly inclined to the plane of said surface, the distance as measured along said external ridge-line between said nozzle of said spray gun and said surface being minimized to such a range as to prevent formation of stains of paint and gradual reduction of film thickness at one end of a film and as to insure sharpness of the outline at said end of said film.

4,578,291
WIND RESPONSIVE ADJUSTABLE DECORATIVE DEVICE

Jon Miner, Arden Hills, Minn., assignor to Internatural Designs, Inc., Minneapolis, Minn.

Filed Dec. 14, 1984, Ser. No. 681,642
Int. Cl.[3] B44C *3/06*
U.S. Cl. 428—8 **5 Claims**

1. The structure for formation of a decorative wind responsive device including:

a. a longitudinally extending mounting rod;

b. stop means on one end of said rod;

c. a plurality of slat members of generally rectangular cross section each having a passage therethrough generally intermediate the ends thereof and extending through the lesser dimension thereof received onto and arranged for rotation about said rod arranged to extend radially outwardly from said rod;

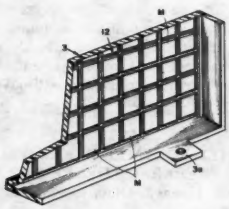
d. means on the other end of said rod and longitudinally moveable therealong to provide a frictional holding force to said slats whereby the slats are moveable with respect to one another and held in selected position thereby; and,

e. universal rotation means arranged adjacent said stop means including mounting means whereby said rod and positioned slats may be suspended in a wind area for free movement in response to wind currents.

4,578,292
RESIN MOLDING DECORATIVE MEMBER

Hiroshi Kanamori, Yokohama City, Japan, assignor to Nissan Motor Co., Ltd., Yokohama City, Japan

Filed Oct. 30, 1984, Ser. No. 666,453
Claims priority, application Japan, Dec. 26, 1983, 58-251469
Int. Cl.[4] B60R *13/00*; B32B *3/00*; B05D *5/06*; B05C *9/06*
U.S. Cl. 428—31 **6 Claims**



1. A resin molding decorative member, comprising a main body of transparent resin which includes:

a back surface comprising a first set of substantially parallel mounting grooves, a second set of substantially parallel

mounting grooves which intersect with said first set of grooves, and a plurality of segments formed between said intersecting grooves, wherein said grooves are designed to engage and fixedly hold a masking jig on said back surface;

a first layer directly applied to a predetermined portion of said back surface comprising a first set of segments selected from said plurality of segments;

a second layer applied to said back surface; and

a design pattern formed by said first and second layers comprising at least said first set of segments selected from said plurality of segments and a second set of segments selected from said plurality of segments.

4,578,293

COMPOSITE STRUCTURES AND A METHOD FOR IMPROVING THE SERVICE LIFE THEREOF

Donald I. Lusk, Mequon, Wis., assignor to A. O. Smith Corporation, Milwaukee, Wis.

Filed Feb. 21, 1984, Ser. No. 582,006

Int. Cl.[4] B27N *5/02*

U.S. Cl. 428—35 **9 Claims**

1. A composite structure, comprising a container formed of a thermoplastic resin and having an inner surface and an outer surface, a fluid under pressure contained within the container and disposed in contact with the inner surface, said thermoplastic resin containing an additive beneficial to the physical properties of said resin, and an outer solid layer disposed on said outer surface of the container and containing a concentration of said additive, exposure of said container to said fluid causing migration of said additive in the container toward said inner surface to thereby set up a concentration gradient causing the additive from said outer layer to migrate across the interface between said outer layer and said container to replace the additive lost through exposure to said fluid.

4,578,294

HEAT-RESISTANT LAMINATES

Isao Ouchi, and Hideo Yusa, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 9, 1984, Ser. No. 578,680

Claims priority, application Japan, Feb. 25, 1983, 58-30570; May 27, 1983, 58-93863

Int. Cl.[4] B32B *1/02*

U.S. Cl. 428—35 **40 Claims**

1. A heat-resistant laminate comprising a first layer of a polymer of propylene or a polyamide; a seventh layer of a polyolefin or a polyamide; a fourth layer of a polymer of vinylidene chloride; a second layer and a sixth layer of an acid modified polyolefin or a mixture of not less than 90% of the acid modified polyolefin and not more than 10% by weight of a copolymer of ethylene and an acrylic ester or an acid modified copolymer of ethylene and an acrylic ester, the second layer and sixth layer being respectively directly jointed to the first layer and the seventh layer; a third layer and a fifth layer of a mixture of 10 to 30% by weight of an acid modified polyolefin and 90 to 70% by weight of a copolymer of ethylene and an acrylic ester or an acid modified copolymer of ethylene and an acrylic ester, the third layer and fifth layer being respectively disposed between the second layer and the fourth layer, and between the fourth layer and the sixth layer.

4,578,295

HIGH BARRIER POLYMER BLEND AND ARTICLES PREPARED THEREFROM

Saleh A. Jabarin, Holland, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jul. 16, 1984, Ser. No. 631,263

Int. Cl.[4] B65D *1/00*; C08F *20/00*

U.S. Cl. 428—35 **15 Claims**

1. A container comprising:

an open top portion;

an enclosed main body portion integral with and downwardly depending from said open top portion;

an enclosed bottom portion integral with and downwardly depending from said enclosed main body portion, said container fabricated from an intimate fusion blend of

(1) a poly(ethylene terephthalate); and

(2) a copolyester formed of the polymeric reaction product of

(A) reactant(s) selected from isophthalic acid, terephalic acid, and their C_1 to C_4 alkyl esters, and any mixture thereof in any proportion,

(B) reactants, 1,3 bis(2-hydroxyethoxy)benzene plus ethylene glycol, and optionally one or more other ester forming dihydroxy organic hydrocarbon reactant(s), and optionally,

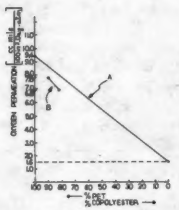
(C) reactant, bis(4-beta-hydroxyethoxyphenyl) sulfone, wherein:

(1) the amount of said 1,3 bis(2-hydroxyethoxy)benzene is 5–90 mole percent of the amount of A reactants,

(2) the combined amount of B and C reactants, is about 110 to 300 mole percent of the amount of A reactants,

(3) the amount of said other ester forming dihydroxy organic hydrocarbon reactant(s) is zero to 20 mole percent of the amount of said A reactants, and

(4) the combined amount of said (C) reactant plus said 1,3 bis(2-hydroxyethoxy)benzene and said other ester forming dihydroxy organic hydrocarbon reactant(s) is not over 90 mole percent of said A reactants.



7. A composition of matter comprising:

an intimate fusion blend of:

(1) a poly(ethylene terephthalate); and

(2) a copolyester formed of the polymeric reaction product of,

(A) reactant(s) selected from isophthalic acid, terephalic acid, and their C_1 and C_4 alkyl esters, and any mixture thereof in any proportion,

(B) reactants, 1,3 bis(2-hydroxyethoxy)benzene plus ethylene glycol, and optionally one or more other ester forming dihydroxy organic hydrocarbon reactant(s), and, optionally,

(C) reactant, bis(4-beta-hydroxyethoxyphenyl) sulfone, wherein:

(1) the amount of said 1,3 bis(2-hydroxyethoxy)benzene is 5–90 mole percent of the amount of A reactants,

(2) the combined amount of B and C reactant is about 110 to 300 mole percent of the amount of A reactants,

(3) the amount of said other ester forming dihydroxy organic hydrocarbon reactant(s) is zero to 20 mole percent of the amount of said A reactants, and

(4) the combined amount of said (C) reactant plus said 1,3 bis(2-hydroxyethoxy)benzene and said other ester forming dihydroxy organic hydrocarbon reactant(s) is not over 90 mole percent of said A reactants.

4,578,296

THERMOFORMED POLYOLEFIN CUP

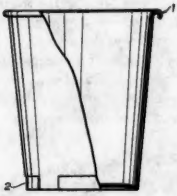
Senji Miyazaki, Sodegaura, and Osamu Touya, Kisarazu, both of Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

Filed Jun. 13, 1984, Ser. No. 620,185

Claims priority, application Japan, Jun. 28, 1983, 58-115153; Jun. 28, 1983, 58-115154; Jun. 28, 1983, 58-115155; Feb. 17, 1984, 59-26961; Feb. 17, 1984, 59-26962

Int. Cl.[4] B65D *5/00*

U.S. Cl. 428—35 20 Claims



1. A cup produced by thermoforming of a polyolefin resin composition sheet, wherein said polyolefin resin is a mixture of polypropylene resin and high density polyethylene resin in a weight ratio of from 9:1 to 1:9, wherein said polyolefin resin composition comprises from 30 to 80% by weight of a polyolefin resin, from 19 to 69% by weight of talc, and from 1 to 10% by weight of titanium dioxide, wherein the ratio of height to average diameter as average edge length is 1.1:1 to 2.0:1.

4,578,297

POLYMER FILM/POLYMER FOAM LAMINATE AND HEAT-RESISTANT CONTAINER FABRICATED THEREFROM

Gary L. Duncan, Fairport, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 11, 1985, Ser. No. 754,052

Int. Cl.[4] B32B *1/02, 3/26*

U.S. Cl. 428—35 12 Claims

1. A laminate structure which comprises:

(a) a thermoplastic polymer matrix core layer having an upper and lower surface and within which is located a strata of voids;

positioned at least substantially within at least a substantial number of voids is at least one spherical void-initiating particle which is phase distinct and incompatible with the matrix material, the void space occupied by said particle being substantially less than the volume of said void, with one generally cross-sectional dimension of said particle at least approximating a corresponding cross-sectional dimension of said void;

(b) a void-free thermoplastic skin layer affixed to the upper surface of core layer (a); and,

(c) a thermoplastic polymer foam layer affixed to the lower surface of core layer (a).

4,578,298

COMPOSITE FILMS FOR PROTECTING DOCUMENTS FROM BEING REPRODUCED

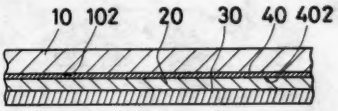
Kazumasa Nagafuchi, Hyogo, Japan, assignor to Kisokaseisangyou Co., Ltd., Osaka, Japan

Filed Jul. 20, 1984, Ser. No. 633,131

Claims priority, application Japan, Jul. 25, 1983, 58-116014 [U]; Oct. 3, 1983, 58-154207[U]; Dec. 10, 1983, 58-190758[U]

Int. Cl.[4] B32B *7/06*

U.S. Cl. 428—40 2 Claims



1. A composite film for protecting documents from being reproduced, said composite film being transparent and adapted to be affixed to the surface of a document on which information has been recorded, whereby the information can be read, but cannot be reproduced, comprising an orange, brown or red colored transparent film, a metallic foil capable of being seen through, said metallic foil being formed by vacuum deposition on the back of the transparent film, and a transparent adhesive layer applied to the surface of said metallic foil.

4,578,299

FLEXIBLE MAGNETIC DISK SHEET

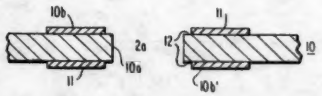
Mikihiko Kato; Tsutomu Okita; Shigeo Komine; Yasutoshi Okuzawa, and Kazuhiko Morita, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 23, 1984, Ser. No. 633,560

Claims priority, application Japan, Jul. 21, 1983, 58-133291

Int. Cl.[4] G11B *5/72*

U.S. Cl. 428—65 28 Claims



1. A flexible magnetic disk sheet including a central circular hole therein, having a protecting layer formed thereon using a composition consisting essentially of (a) a compound including one or more atomic groups providing lubricity at at least one end of a main chain or a side chain of the molecule of the compound and one or more ester bonds of acrylic acid or methacrylic acid at at least one end of a main chain or a side chain of the molecule of the compound, and (b) an aromatic ketone, wherein said protecting layer is formed only on a surface portion surrounding the edge of the central circular hole of the flexible magnetic disk sheet, wherein the relative amount of the aromatic ketone (b) is from 0.5 to 20 parts by weight per 100 parts by weight of the compound (a), said protecting layer being cured by ultraviolet light.

4,578,300

LAYER FOR FIXING MOQUETTES, CARPETS, RUGS OR THE LIKE

Brigitte I. Merlet, 14, avenue Dubonnet, Courbevoie (Hauts de Seine), France

Continuation-in-part of Ser. No. 622,137, Jun. 19, 1984, abandoned. This application Sep. 3, 1985, Ser. No. 771,480
Claims priority, application France, Jun. 22, 1983, 83 10334
Int. Cl.[4] B32B 5/06
U.S. Cl. 428—91 3 Claims

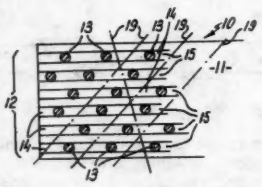
1. Layer for fixing moquette, carpets, rugs or the like, characterised in that it is composed of a lower layer of needled fibres and a separating band transversed by a proportion of the fibres of the lower layer, the lower layer of fibres being equipped with an anti-slip layer, the upper layer, formed by the proportion of fibres which have traversed the separating band, being coated with permanent glue.

4,578,301

FABRIC REINFORCED CEMENT STRUCTURE

Brian Currie, Dunmurry; Thomas Gardiner, Carrickfergus, and Henry M. Green, Knock, all of Northern Ireland, assignors to Lambeg Industrial Research Association and Ulster Polytechnic, both of, United Kingdom

Filed Aug. 21, 1984, Ser. No. 642,782
Claims priority, application United Kingdom, Aug. 23, 1983, 8322645
Int. Cl.[4] B32B 5/12
U.S. Cl. 428—109 13 Claims



1. A composite structure comprising a water-hardened matrix and reinforcement comprising a plurality of layers of open mesh textile fabric, each layer of said textile fabric being composed of a plurality of united sets of textile elements, said elements of each said set lying straight and parallel to each other, the spacing between adjacent elements is greater than the widths of each of said elements, and a plurality of irregular cavities extending transversely of and within said reinforcement and containing plugs of said matrix material.

4,578,302

REINFORCED TAPE LAMINATES

Robert C. Schmidt, Jr., Port Murray, and Paul P. Puletti, Glen Gardner, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Jun. 27, 1985, Ser. No. 749,341
Int. Cl.[4] B32B 5/12
U.S. Cl. 428—110 20 Claims

1. A reinforced gummed tape laminate comprising fibers bonded between two substrates using a hot melt pressure sensitive adhesive composition comprising:

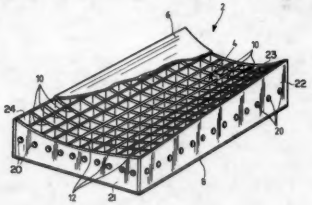
(a) 10 to 35% by weight of an A—B—A block or A—B—A—B—A— multi-block copolymer where the A component is styrene and the B component is butadiene or hydrogenated butadiene and wherein the A components comprise at least 28 parts per hundred parts copolymer;
(b) 45 to 70% by weight of a compatible tackifying resin;
(c) 5 to 30% by weight of a plasticizing oil;
(d) 0 to 5% by weight of a petroleum derived wax; and
(e) 0.1 to 2% by weight of a stabilizer.

4,578,303

FIBER COMPOUND STRUCTURAL COMPONENT AND METHOD FOR MAKING SUCH A COMPONENT

Josef Kundinger; Claus Hohmann, and Martin Mühleck, all of Donauwörth, Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Apr. 9, 1984, Ser. No. 597,931
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1983, 3315246
Int. Cl.[4] B32B 3/12; G02B 5/08
U.S. Cl. 428—116 4 Claims



1. A method for manufacturing a structural component of fiber composite material and having at least one surface with a contour curved in space, comprising the following steps:

(a) curing flat fiber composite material to produce cured, flat fiber composite panels,
(b) cutting said cured, flat fiber composite panels into two sets of already cured ribs so that each rib in both sets has a first edge conforming along its length to said contour curved in space and a second opposite edge,
(c) cutting slots into one set of ribs so that said slots extend from said first conforming edge into the respective rib,
(d) cutting slots into the other set of ribs so that said slots extend from said opposite edge into the respective rib,
(e) assembling said first and second sets of already cured ribs by intersecting the ribs of one set with the ribs of the other set with the aid of said slots and interconnecting said ribs to form a rigid, cured core of cured fiber compound material having a honeycomb type configuration with an effective dimensional and form stability as a result of said ribs being already cured,
(f) laminating uncured sheet means of the same fiber composite material as said ribs onto said rigid, cured core to form at least one cover, and
(g) curing said uncured sheet means to thereby bond said cover to said rigid, cured core to form said structural component in which said cover assumes said contour

curved in space without any machining operations, whereby said structural component is free of internal stress when said structural component is exposed to changing temperatures.

4,578,304

MULTILAYER WIRING SUBSTRATE

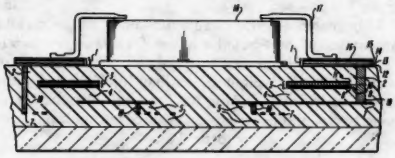
Hiroyuki Hamaguchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 6, 1984, Ser. No. 678,828

Claims priority, application Japan, Dec. 28, 1983, 58-249488

Int. Cl.⁴ B32B *15/00, 3/00;* C25D *5/10, 5/28*

U.S. Cl. 428—209 **7 Claims**



1. A multilayer wiring substrate for mounting a plurality of electronic circuit elements thereon, comprising:

a plurality of wiring layers having wirings to be connected with said electronic circuit elements;

a plurality of dielectric layers including an organic material for providing insulation between said wiring layers;

a ceramic layer upon which said wiring layers and dielectric layers are provided;

a plurality of pads formed on the uppermost one of said dielectric layers and connected to wiring members by pressure bonding; and

at least one discontinuous metal laminate including at least two metal layers formed in at least one of said dielectric layers and adjacent to said pads for preventing pressure applied during the bonding of the pads from disturbing said wiring layers.

4,578,305

PHOTOCHROMIC ASSEMBLY COMPRISING PHOTOCHROMIC GLASS BEADS IN POLYMER LATEX

Stephen R. Postle, Brentwood, and Samuel B. Kingston, Doddinghurst, both of England, assignors to Ciba-Geigy AG, Basel, Switzerland

Division of Ser. No. 471,554, Mar. 2, 1983, Pat. No. 4,489,108. This application May 7, 1984, Ser. No. 607,900

Claims priority, application United Kingdom, Mar. 11, 1982, 8207067

The portion of the term of this patent subsequent to Apr. 24, 2001, has been disclaimed.

Int. Cl.⁴ B32B *27/00*

U.S. Cl. 428—212 **2 Claims**

1. A photochromic assembly which comprises coated onto a self-supporting flexible plastic material

(a) a polymer latex layer comprising polymer particles being less than 0.05 um in diameter and from 10% to 40% by weight of the total solids of the latex photochromic glass beads from 0.05 μm to 50 μm in size, the polymer latex having been prepared by emulsion polymerising at a temperature of from 15° C. to 90° C. a monomer or monomer mixture which consists of a monomer which is an alkyl acrylate or an alkyl methacrylate or a monomer mixture comprising both an alkyl acrylate and an alkyl methacrylate or a monomer mixture comprising an alkyl acrylate or an alkyl methacrylate or a mixture thereof together with up to 5% by weight of an ethylenically unsaturated copolymerisable acid or up to 30% by weight of other ethylenically unsaturated comonomers or a mixture thereof in the presence of at least 12% by weight of the monomers present of an anionic surfactant by use of a redox initiator system which is present to the extent of from 0.1 to 3% by weight of the monomers present, and

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4,578,306

WOVEN SHEETING MATERIAL AND METHOD OF MAKING SAME

Gary L. Heiman, Jerusalem, Israel, assignor to Standard Textile Company, Inc., Cincinnati, Ohio

Filed Aug. 17, 1983, Ser. No. 524,187

Int. Cl.⁴ D03D *15/00*

U.S. Cl. 428—225 **20 Claims**

1. In a woven sheeting material having warps and wefts and which is free of chemical no-iron surface treatment or finish, the improvement wherein each of said warps is made of a blend of a natural material and a synthetic material and each of said wefts is made substantially entirely of said natual material.

11. In a plainwoven sheeting material for institutional use and having warps and wefts and which is free of chemical no-iron surface treatment or finish, the improvement wherein each of said warps is made of a blend of cotton and polyester and each of said wefts is made entirely of cotton.

4,578,307

NONWOVEN SHEET HAVING IMPROVED HEAT DETERIORATION RESISTANCE AND HIGH ELONGATION

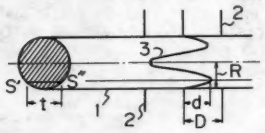
Akira Niki, Osaka, and Hirofumi Iwasaki, Ashiya, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Japan

Filed Mar. 15, 1985, Ser. No. 712,243

Claims priority, application Japan, Mar. 17, 1984, 59-50184; Mar. 17, 1984, 59-50185; Mar. 17, 1984, 59-50186

Int. Cl.⁴ D04H *3/10, 3/14, 3/16*

U.S. Cl. 428—288 **21 Claims**



1. A nonwoven sheet composed of polyethylene terephthalate filaments, wherein the filaments have an elongation at breakage of at least 100%, a shrinkage in boiling water of at least 15%, the filament section is a circular section having a radius R, and the average refractive index $n \parallel 0$) of the central portion of the filament section and the average refractive index $n \parallel (0.8)$ of the portion apart by 0.8R from the center satisfy the following requirements:

$$n \parallel (0) \leqq 1.640 \text{ and } [n \parallel (0.8) - n \parallel (0)] \geqq 6 \times 10^{-3}.$$

4,578,308

LAMINATED BOARD LINED WITH THERMALLY AND ELECTRICALLY CONDUCTIVE MATERIAL

Kiyoshi Hani, Sagamihara; Takako Takei, Tokyo; Minekazu Kodama, Takatsuki, and Toshiyuki Sugano, Atsugi, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 6, 1984, Ser. No. 647,638

Claims priority, application Japan, Oct. 14, 1983, 58-192090

Int. Cl.⁴ B32B *5/22, 15/12*

U.S. Cl. 428—297 **10 Claims**

1. A laminated board lined with a thermally and electrically conductive material, which comprises:

(a) a prepreg sheet formed of an alumina paper made from a mixture of alumina fibril, as the prinicpal component,

having a fiber diameter of 100 microns or smaller and a fiber length which is ten times or more as long as the fiber diameter, a microfibrillar organic fiber as a binding agent, and a thermosetting resin; and

(b) an electrically conducitve foil bonded to said prepreg sheet.

4,578,309

LAMINATED MATERIAL

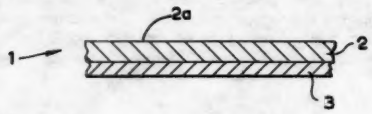
Ernest H. Worth, Edwalton Lodge, Edwalton, Nottingham, United Kingdom

Filed Jul. 30, 1984, Ser. No. 636,009

Claims priority, application United Kingdom, Apr. 5, 1984, 8408756

Int. Cl.[4] B32B *3/26;* B05D *1/36;* C09J *7/02*

U.S. Cl. 428—315.5 14 Claims



1. A laminated material comprising a layer of a microcellular material capable of changing colour in response to the application of heat and pressure and a layer of adhesive bonded thereto.

4,578,310

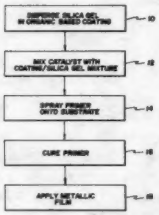
METHOD OF PRODUCING ADHERENT METALLIC FILM

Raymond W. Hatfield, Warren, Mich., assignor to Michael Landey, Grosse Pointe Shores, Mich.

Filed Jul. 22, 1985, Ser. No. 757,345

Int. Cl.[4] B32B *27/00, 9/04, 15/08;* B05D *1/00*

U.S. Cl. 428—334 22 Claims



1. A method of producing an electromagnetic interference shield on a plastic substrate comprising the steps of:

a. priming the surface of the substrate by applying an organic-based coating containing a dispersion of silica gel; and

b. applying a metallic film onto the primed surface.

4,578,311

MAGNETIC RECORDING MEDIUM

Tadashi Ishikuro; Ryuji Shirahata; Takahito Miyoshi, and Masaaki Fujiyama, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 29, 1984, Ser. No. 614,930

Claims priority, application Japan, May 27, 1983, 58-92495

Int. Cl.[4] G11B *5/72*

U.S. Cl. 428—336 5 Claims

1. A magnetic recording medium comprising a nonmagnetic support having provided on opposite surfaces thereof a magnetic recording layer, and a backing layer containing carbon black and a binder, said carbon having an average particle size of 200 to 500 mμ and the weight ratio of carbon black and the binder being 1:3.0 to 1:10.

4,578,312

PHENOXY RESINS AND USE THEREOF IN ELECTRIC INSULATION

Luciano Biorcio, and Carlo Mensi, both of Alessandria, Italy, assignors to The P. D. George Co., St. Louis, Mo. and Industrie Vernici Italiane S.p.A., Milan, Italy

Division of Ser. No. 556,981, Dec. 1, 1983, Pat. No. 4,526,912. This application Mar. 27, 1985, Ser. No. 716,768

Claims priority, application Italy, Feb. 16, 1983, 19614 A/83

Int. Cl.[4] B32B *0/00*

U.S. Cl. 428—336 13 Claims

1. Insulated electric conductor comprising a metallic conductor and a homogeneous layer of insulating material coated on metal, said insulating material comprising a phenoxy resin with a molecular weight higher than 10,000, cured with at least two materials chosen from the group of phenolic resins, melamine resins, and polyisocyanates blocked with phenol, cresol, xylene, caprolactam or benzyl alcohol.

4,578,313

POWDER FOR MAGNETIC RECORDING MEDIA AND PROCESS FOR MANUFACTURING THE SAME

Takeo Ito, Yokohama; Tadashi Ido, Ebina; Hajime Takeuchi; Minoru Hashimoto, both of Yokohama; Tatsumi Maeda, Kawasaki, and Masashi Awa, Yokohama, all of Japan, assignors to Tokyo Shibauru Denki Kabushiki Kaisha, Japan

Filed Sep. 28, 1983, Ser. No. 536,855

Claims priority, application Japan, Oct. 19, 1982, 57-182131

Int. Cl.[4] B32B *19/02;* G11B *5/712*

U.S. Cl. 428—403 9 Claims

1. A powder for a magnetic recording medium comprising:

(a) a plurality of hexagonal ferrite magnetic particles having a mean diameter of about 0.005 to 0.3 microns and a coercive force of about 200 to 2000 Oe, and

(b) a coating covering the surfaces of said magnetic particles, the coating being a carbonaceous residue resulting from the thermal decomposition of an organic material, the amount of said residue coating bring about 0.1 to about 5 wt. percent of the magnetic particles.

6. A method for manufacturing a powder for a magnetic recording medium comprising the steps of:

(a) applying one or more organic materials to the surfaces of a plurality of hexagonal ferrite magnetic particles by dispersing said particles in a solution containing said organic material;

(b) separating the magnetic particles having the organic material as a coating from the solution; and

(c) heating the magnetic particles having the organic coating thereon to a temperature at which the organic material thermally decomposes to form a carbonaceous residue coating of about 0.1 to about 5 wt. % of said magnetic particles;

wherein the mean diameter and the coercive force of the hexagonal ferrite particles are about 0.005 to 0.3 microns and about 200 to 2000 Oe, respectively.

8. A magnetic recording medium comprising:

(a) a base made of a nonmagnetic material; and

(b) a magnetic layer on the base having a plurality of hexagonal ferrite magnetic particles and an organic binder, the magnetic particles being covered with a carbonaceous residue resulting from the thermal decomposition of an organic material, the amount of the residue coating being

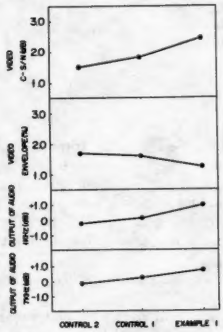
about 0.1 to about 5 wt. % of the magnetic particles, the means diameter and coercive force of the magnetic particles being about 0.005 to 0.3 microns and about 200 to 2000 Oe, respectively.

4,578,314

MAGNETIC RECORDING MEDIUM AND METHOD FOR MANUFACTURE THEREOF

Hiroshi Ohta, Komoro; Shinji Abe, and Kiyoto Fukushima, both of Saku, all of Japan, assignors to TDK Corporation, Japan

Filed Sep. 17, 1984, Ser. No. 651,219
Claims priority, application Japan, Sep. 16, 1983, 58-169290
Int. Cl.[4] G11B *5/70*
U.S. Cl. 428—403 **14 Claims**



1. A magnetic recording medium having deposited on the surface of a non-magnetic substrate a magnetic layer formed by dispersing a powdered magnetic substance and a powdered abrasive in a binder, which magnetic recording medium is characterized by having abrasive particles activated on the surface thereof by adsorption of from 0.5% to 30% by weight based on said abrasive of a surface active agent by contacting the particles with the vapors of a solution containing the surface active agent in a solvent.

6. A method for the manufacture of a magnetic recording medium having deposited on the surface of a non-magnetic substrate a magnetic layer formed by dispersing a powdered magnetic substance and a powdered abrasive in a binder, which method comprises dissolving a surface active agent in a solvent, vaporizing the resultant solution, bringing the produced gas into contact with said powdered abrasive thereby producing a surface activated abrasive haing adsorbed on its surface from 0.5% to 30% by weight based on said abrasive of the surface active agent, mixing said abrasive with said powdered magnetic substance and said binder and applying the resultant mixture on the surface of said non-magnetic substrate.

4,578,315

PHENOLIC RESINS, CARBOXYLIC RESINS AND THE ELASTOMERS CONTAINING ADHESIVE

Michael Santorelli, Schenectady, N.Y., assignor to Schenectady Chemicals Inc., Schenectady, N.Y.

Division of Ser. No. 701,205, Feb. 13, 1985. This application Aug. 15, 1985, Ser. No. 766,019
Int. Cl.[4] B32B *27/38*
U.S. Cl. 428—414 **28 Claims**

1. A laminate of copper and a polyimide film bonded by an adhesive composition comprising:

(a) 4–72% by weight phenol-aldehyde resins or a resin of an ethylenically unsaturated phenol;

(b) 4–72% by weight 1,2-epoxy resin;

(c) 10–80% by weight of an ethylene acrylic elastomer; wherein the ratio of phenol aldehyde to 1,2-epoxy resin is from 1:4 to 4:1.

4,578,316

MULTI-LAYER ORIENTED POLYPROPYLENE FILMS WITH LOW COF SKIN(S)

Melvil B. Clauson, Newark, and John R. Wagner, Jr., Rochester, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 19, 1984, Ser. No. 683,781
Int. Cl.[4] B32B *27/08*
U.S. Cl. 428—516 **10 Claims**

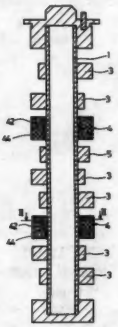
1. An oriented film structure comprising a polypropylene film having on at least one surface thereof a layer of a blend of (I) a member selected from the group consisting of a medium density polyethylene, a high density polyethylene and mixtures thereof and (II) polypropylene.

4,578,317

JOURNAL

Keiji Nakamura, Misato, Japan, assignor to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed Jun. 16, 1983, Ser. No. 504,729
Claims priority, application Japan, Jun. 17, 1982, 57-89574[U]
Int. Cl.[4] B22F *7/00, 3/00*
U.S. Cl. 428—547 **6 Claims**



1. A composite structure comprising a journal and a rotary shaft, said journal being made of a sintered alloy and assembled to said rotary shaft, said journal comprising an outer portion thereof made of a porous solid phase sintered alloy and used for sliding engagement with a journal bearing and the inner portion thereof made of a liquid phase sintered alloy secured to said rotary shaft, said liquid phase sintered alloy being sinterable at the same temperature as said solid phase sintered alloy to be metallurgically diffusion-bonded to both the solid phase alloy and the rotary shaft.

4,578,318

SHEET METAL ORNAMENTS HAVING A LACY APPEARANCE AND PROCESS FOR MAKING THEM

Donald C. Schoch, Sandy Hook, Conn., and Albert C. Engelmann, Esmond, R.I., assignors to Tamerlane Corporation, Esmond, R.I.

Filed Oct. 17, 1984, Ser. No. 661,725
Int. Cl.[4] B32B *3/10*; B44C *1/22*; B44F *7/00*
U.S. Cl. 428—615 **15 Claims**

1. A coated apertured sheet metal ornament exhibiting the appearance of lace, comprising:

a metal sheet having a front viewing surface and a rear surface;

said sheet being intricately apertured from surface to

surface, to define a lace-like pattern of unapertured areas;

said sheet being intricately etched in further portions through said front surface to depths only partially through said sheet, to create recessed areas in said sheet;

said intricately etched further portions defining unetched portions having dimensions which approximate the dimensions of lace stitching, to enhance the lace-like appearance of said pattern;

said apertures and intricately etched further portions being generally substantially wider than adjacent solid portions of said ornament, for delicacy of appearance;

the width of any solid area adjacent to a recessed area or an aperture in the metal sheet being at least equal to the depth of the adjacent recess or aperture; and

a thin layer of coating on said sheet to enhance the lacy decorative appearance.

4,578,319

SURFACE TREATED STEEL SHEET HAVING AN EXCELLENT WELDABILITY AND ITS PRODUCTION METHOD

Nobuyoshi Shimizu; Terunori Fujimoto; Tsuneo Inui, and Masatoki Ishida, all of Yamaguchi, Japan, assignors to Toyo Kohan Co., Ltd., Tokyo, Japan

Division of Ser. No. 608,088, May 8, 1985. This application Sep. 30, 1985, Ser. No. 782,262

Int. Cl.[4] C25D *5/12*

U.S. Cl. 428—632 **2 Claims**

1. A surface treated steel sheet consisting of a steel base having three layers thereon in the following order: a bottom layer of 30 to 300 mg/m^2 of metallic chromium, a middle layer of 10 to 500 mg/m^2 of metallic tin or 10 to 500 mg/m^2 of tin-nickel alloy containing 20 to 60 weight % of nickel and a top layer of hydrated chromium oxide of 2 to 18 mg/m^2 as chromium.

4,578,320

COPPER-NICKEL ALLOYS FOR BRAZED ARTICLES

Deepak Mahulikar, West Haven, and Eugene Shapiro, Hamden, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Mar. 9, 1984, Ser. No. 587,750

Int. Cl.[4] B32B *15/20*

U.S. Cl. 428—674 **15 Claims**

1. A copper alloy having improved ductility at elevated temperatures, said alloy consisting of about 5% to about 45% nickel, about 0.4% to about 1.1% manganese, about 0.003% to about 0.04% phosphorous and the balance essentially copper.

4,578,321

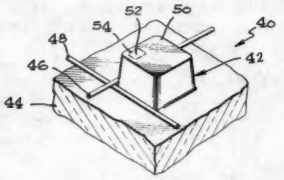
ALTERING THE SWITCHING THRESHOLD OF A MAGNETIC MATERIAL

William E. Ross, Woodland Hills, and Bruce E. MacNeal, Fullerton, both of Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Division of Ser. No. 320,819, Nov. 12, 1981. This application Jun. 13, 1983, Ser. No. 503,404

Int. Cl.[4] H01F *10/02*

U.S. Cl. 428—693 **3 Claims**



1. A magneto-optic post element formed from a magnetic material that exhibits magnetic domain characteristics and supported by a nonmagnetic material, and coincident current select conductors acting upon the post element to selectively establish a preferred direction of magnetic orientation in the magnetic material, the implemented post element characterized by:

(a) said magnetic material having a high anisotropy characteristic;

(b) a first region in said magnetic material having a low anisotropy characteristic relative to the high anisotropy characteristic of said magnetic material,

(c) an interface developed by the juxtaposition of said first region and said magnetic material so that said first region is exchange coupled with said magnetic material, and

(d) an easy axis of magnetization in said magnetic material and in said first region so that the conductors act upon said implemented post element for the nucleation of a domain wall in said first region and the movement of the domain wall from said low anisotropy material of said first region, through said interface, and into said high anisotropy magnetic material where the propagation of the domain wall can be continued to affect a reversal of magnetic orientation in the magnetic material.

4,578,322

RECORDING MEDIUM

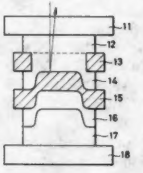
Mitsuharu Sawamura, Yokohama; Susumu Ito, Tokyo; Masaaki Matsushima, Machida; Hiroyoshi Kishi, Tokyo; Eizo Sasamori, Yokohama; Satoshi Yoshihara; Shigeharu Iijima, both of Kawasaki, and Katsuhiko Takano, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 14, 1985, Ser. No. 620,806

Claims priority, application Japan, Jun. 16, 1983, 58-108490

Int. Cl.[4] G11B *9/00*

U.S. Cl. 428—694 **2 Claims**



1. An optical recording medium, comprising:

(a) a first recording layer;

(b) a second recording layer provided in contiguity to said first recording layer; and

(c) a separation layer for spatially separating said first and second recording layers;

said first recording layer having a sufficient film thickness not to permit the recording to be effected on said second recording layer, while the recording operation is performed on said first recording layer, and said recording operation being effected on said second recording layer at positions corresponding to defective portions in said first recording layer,

said separation layer having an optical film thickness corresponding to an integral multiple of one half of a wavelength λ of the recording light beam,

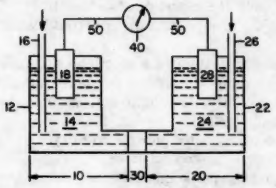
wherein said separation layer has such function that permits the recording to be effected on said second recording layer with the same effeciency as that of the recording on said first recording layer, when said recording operations are effected on said second recording layer in accordance with the defects in said first recording layer.

4,578,323

FUEL CELL USING QUINONES TO OXIDIZE HYDROXYLIC COMPOUNDS

William Hertl, Corning, and Robert G. Schaeffler, Elmira, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Oct. 21, 1983, Ser. No. 544,279
Int. Cl.[4] H01M *8/20, 8/22*
U.S. Cl. 429—15 **17 Claims**



1. A chemical fuel cell capable of producing electricity from organic compounds and forming oxidation products thereof, having separate oxidation and reduction half cells and a means for separating the half cells while permitting ions to flow between the half cells is characterized by:

(a) an anaerobic oxidation half cell comprising:

(i) an electrically conductive, electron donor fuel solution having an effective amount of an electron-accepting, quinone compound and an electron-donating polyhydroxylic organic compound;

(ii) a cell chamber for containing the fuel solution; and

(iii) an electrode contacting the fuel solution; and

(b) a reduction half cell comprising:

(i) an electrically conductive, ionic solution;

(ii) a cell chamber for containing the ionic solution; and

(iii) an electrode contacting the ionic solution;

whereby the polyhydroxylic compound is oxidized and an electrical potential exists between the electrodes.

4,578,324

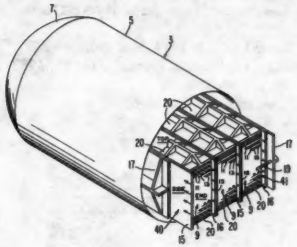
ACTIVE COOLING SYSTEM FOR ELECTROCHEMICAL CELLS

Charles W. Koehler, Fremont; Gerrit van Ommering, San Francisco, both of Calif., and Neil H. Puester, Aurora, Colo., assignors to Ford Aerospace & Communications Corporation, Detroit, Mich.

Filed Oct. 5, 1984, Ser. No. 658,015
Int. Cl.[4] H01M *8/04*
U.S. Cl. 429—26 **9 Claims**

1. An active cooling system for cooling several substantially planar electrochemical cells arranged in a stack, said cooling system comprising:

means for directing a flow of cooling fluid parallel to the plane of, and adjacent to, each cell; and



means for substantially equalizing the rate of flow of cooling fluid past each cell; wherein

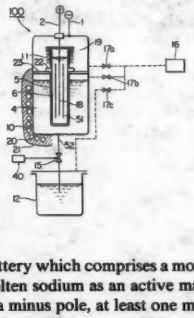
each cell experiences substantially the same cooling environment.

4,578,325

POWER STORAGE SYSTEM USING SODIUM-SULFUR BATTERIES

Tadashi Gotou; Fumio Kawamura; Norihiko Sagawa, and Hideo Yusa, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 17, 1984, Ser. No. 581,270
Claims priority, application Japan, Feb. 18, 1983, 58-24611
Int. Cl.[4] H01M *10/48*
U.S. Cl. 429—91 **26 Claims**



1. A sodium-sulfur battery which comprises a molten sodium chamber containing molten sodium as an active material for a minus pole and having a minus pole, at least one molten sulfur chamber containing molten sulfur as an active material for a plus pole and having a plus pole, both said chambers being partitioned by a sodium ion-permeating solid electrolyte, a sodium storage tank communicating with the molten sodium chamber, and a draining mechanism for withdrawing the molten sodium from the molten sodium chamber to the sodium storage tank, when desired, wherein said draining mechanism includes means for detecting when said molten sodium directly contacts said molten sulfur through said sodium ion-permeating solid electrolyte, said draining mechanism also including means, co-operating with said means for detecting, for withdrawing the molten sodium from the molten sodium chamber to the sodium storage tank when said means for detecting detects direct contacting between the molten sodium and molten sulfur through the sodium ion-permeating solid electrolyte.

4,578,326

NOVEL MACROMOLECULAR MATERIAL FOR USE IN REALIZING ELECTROLYTES AND/OR ELECTRODES

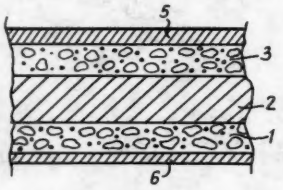
Michel Armand, Echirolles; Daniel Muller, Pau, both of France; Michel Duval, Montreal, and Paul-Etienne Harvey, Longueuil, both of Canada, assignors to Societe Nationale Elf Aquitaine, Courbevoie, France and Hydro-Quebec, Montreal, Canada

Filed Feb. 28, 1984, Ser. No. 584,535

Claims priority, application France, Jun. 15, 1983, 83 09886; Indonesia, Mar. 11, 1983, 9 228

Int. Cl.[4] H01M *6/18, 4/62*

U.S. Cl. 429—192 36 Claims



1. An ionically conductive macromolecular material having improved conductivity at temperatures higher and lower than the melting point of ethylene oxide crystallities which comprises a solid solution of at least one ionic compound dissolved in a macromolecular material, said macromolecular material being a copolymer of ethylene oxide and a cyclic ether oxide, said copolymer having a polyether structure and a proportion of cyclic ether units to ethylene oxide units whereby said macromolecular material is non-crystalline at ambient temperatures.

4,578,327

ELECTRIC CELLS USING FLUORINATED GRAPHITE AS ACTIVE MATERIAL OF POSITIVE ELECTRODE

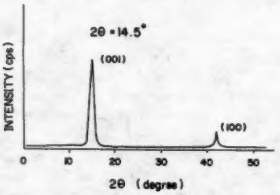
Shigeakira Saito, and Masayuki Fukuoka, both of Shizuoka, Japan, assignors to Asahikasei Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 585,876, Mar. 2, 1984, abandoned. This application Aug. 5, 1985, Ser. No. 763,075

Claims priority, application Japan, Apr. 5, 1983, 58-58644; Jun. 9, 1983, 58-101701

Int. Cl.[4] H01M *6/14*

U.S. Cl. 429—194 31 Claims



1. An electric cell comprising a negative electrode having a light metal as an active material, an electrolyte which is not reduced by current flowing through the cell, and a positive electrode having, as an active material, a treated fluorinated graphite having the formula $(C_XF)_n$ wherein x is a numerical value of about 2.0 to about 5.5 and n refers to an indefinite number of the recurring (C_XF) units and having a crystalline structure exhibiting a peak at about 13.7° to about 15.0° in terms of an angle of 2θ corresponding to the diffraction at the (001) plane in a X-ray diffraction pattern, a peak in the vicinity of 685.3 eV due to the F_{1S} and two peaks in the vicinity of 287.5 eV and 284.3 eV due to the C_{1S} in the spectrum of electron spectroscopy of chemical analysis, two peaks in the vicinity of 1100 cm^{-1} and 1240 cm^{-1} in the IR spectrum, an electric conductivity of at least about $10^{-8}\Omega^{-1}$ cm^{-1} and a thermal stability up to 200° C. in air from the viewpoint of a X-ray diffraction pattern, said graphite treated with an alkali or potassium iodide solution prior to insertion of said graphite into said cell so as to increase the shelf life of the cell and improve the flatness of the cell discharge curve.

4,578,328

PHOTOPATTERNABLE POLYIMIDE COMPOSITIONS AND METHOD FOR MAKING

William D. Kray, San Bernadino, Calif., assignor to General Electric Company, Waterford, N.Y.

Filed Jul. 9, 1984, Ser. No. 628,923

Int. Cl.[4] G03C *5/16, 1/70, 1/76*

U.S. Cl. 430—18 18 Claims

1. A method for patterning an insulative layer on a substrate, comprising:

(A) applying a coating of a solution comprising a polyimide polymer having at least one pendant aromatic group and at least one bis-maleimide to a substrate in the substantial absence of light;

(B) allowing the coated substrate to dry;

(C) masking the coated substrate;

(D) exposing the masked substrate to a source of light for a time sufficient to effect crosslinking of said polymer having at least one pendant aromatic group and said bis-maleimide; and

(E) developing the exposed substrate.

10. An article of manufacture prepared by a method comprising:

(A) applying a coating of a solution comprising polyimide polymer having at least one pendant aromatic group, and at least one bis-maleimide to a substrate in the substantial absence of light;

(B) allowing the coated substrate to dry;

(C) masking the coated substrate;

(D) exposing the masked substrate to a source of light for a time sufficient to effect crosslinking of said polymer having at least one pendant aromatic group and said bis-maleimide; and

(E) developing the exposed substrate.

4,578,329

METHOD OF MARKING AN ARTICLE HAVING AT LEAST A POLYOLEFIN SURFACE AND AN ARTICLE HAVING A POLYOLEFIN SURFACE PROVIDED WITH A BLACK MARK OF DECOMPOSED POLYOLEFIN

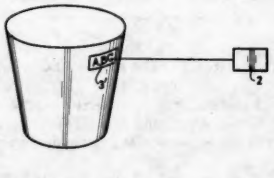
Albert Holsappel, Hardenberg, Netherlands, assignor to Wavin B.V., Netherlands

Filed Nov. 23, 1983, Ser. No. 554,803

Claims priority, application Netherlands, Nov. 26, 1982, 8204604

Int. Cl.[4] B23K *26/18;* B65D *1/00;* B05D *3/06;* G03C *1/72*

U.S. Cl. 430—18 17 Claims



1. An article having at least a polyolefin surface, provided with a mark obtained by exposing said surface to the action of a laser beam, wherein the polyolefin comprises a nondye laser

radiation absorbing substance in an amount sufficient for decomposing the poly-olefin by the laser beam energy.

4,578,330

HYDROXYALUMINUMPHTHALOCYANINE HAVING REDUCED GREEN ABSORPTION

Michael T. Regan, Fairport, and Hal E. Wright, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

PCT No. PCT/US84/00922, § 371 Date Nov. 16, 1984, § 102(e) Date Nov. 16, 1984, PCT Pub. No. WO85/00440, PCT Pub. Date Jan. 31, 1985

PCT Filed Jun. 18, 1984, Ser. No. 674,655

Int. Cl.⁴ G03G *5/06*

U.S. Cl. 430—37 **7 Claims**

1. A migraton imaging dispersion comprising the hydroxyaluminumphthalocyanine of as an electrically photosensitive colorant.

4,578,331

COLOR IMAGE FORMING METHOD

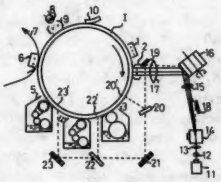
Itsuo Ikeda, Sagamihara; Junji Kurokawa, Yokohama; Mitsuo Hasebe, Tokyo; Seiichi Miyagawa, Nagareyama, and Hajime Hariu, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Jul. 10, 1984, Ser. No. 629,354

Claims priority, application Japan, Jul. 11, 1983, 58-124857; Jul. 11, 1983, 58-124859; Jul. 11, 1983, 58-124858; Jul. 12, 1983, 58-125455

Int. Cl.⁴ G03G *13/01*

U.S. Cl. 430—42 **8 Claims**



1. An electrophotographic color image forming process wherein three light beams each representing image information of one of three primary colors or yellow, magenta and cyan of a document in color to be recorded are projected against an electrophotographic photosensitive member to expose same and form electrostatic latent images thereon, each of the electrostatic latent images is developed with a toner of one of the three different colors to form toner images of three different colors, and the toner images of the three different colors thus produced are printed by transfer-printing on a transfer-printing sheet to provide a color image of the document, characterized in that the electrophotographic photosensitive member is composed of at least a conductive substrate, a photoconductive material layer disposed on said substrate and a transparent electrically insulating layer disposed on said photoconductive material layer, and that the process comprises the steps of:

(a) uniformly charging a surface of the photoelectrographic photosensitive member from the transparent insulating material layer side by means of direct-current corona discharge of one polarity;

(b) projecting the three light beams each representing image information of one of the three colors against the surface of the photosensitive member to expose same and successively write a multiplicity of image information of three colors on the surface of the photosensitive member as a repeating series of three stripes of different colors simultaneously as or immediately before the electrophotographic photosensitive member is subjected from the transparent insulating material layer side by a direct-current or alternating-current corona discharge of a polarity opposite the one polarity of the corona discharge performed in step (a);

(c) selectively irradiating portions of the surface of the electrophotographic photosensitive member exposed to one of the three light beams to form electrostatic latent images corresponding to the image information of the one of the three colors and reverse developing the electrostatic latent image with a toner of the color to form toner images of the color, the aforesaid step being repeated for the image inforamtion of all the three different colors; and

(d) printing by transfer-printing on a surface of a transfer-printing sheet the toner images of the three different colors obtianed in step (c).

4,578,332

METHOD OF REMOVING ELECTROSTATIC CHARGE FROM ELECTROPHOTOGRAPHIC PHOTOSENSITIVE DEVICE

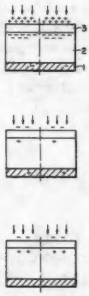
Akitoshi Toda, and Yoshiyuki Mimura, both of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 9, 1984, Ser. No. 669,990

Claims priority, application Japan, Nov. 9, 1983, 58-209116; Nov. 9, 1983, 58-209117

Int. Cl.⁴ G03G *13/24*

U.S. Cl. 430—55 **16 Claims**



1. In a process for producing a copy having the steps of forming, in an electrophotographic photosensitive device having a conductive layer overlain by a photoconductive layer which in turn is overlain by a transparent insulating layer, an electrostatic latent image by an image forming process which includes at least an exposure to a light image simultaneously with a D.C. or A.C. charging and, after making a copy from said electrostatic latent image, erasing said electrostatic latent image by removing the residual electrostatic charge, the improvement comprising:

a method of removing electrostatic charge from said photosensitive device comprising: a first step of uniformly charging said photosensitive device by a D.C. charger while subjecting said photosensitive device to an exposure over the whole area thereof; a second step of effecting a charging for adjustment of potential level so as to adjust the potential of said photosensitive device from the level obtained as a result of the charging in the first step to the desired level; and a third step of exposing the whole area of said photosensitive device,

wherein the voltage applied to said D.C. charger in said first step including the D.C. charging and exposure of the whole area is equal to or higher than the absolute value of the D.C. voltage or the effective value of the A.C. voltage applied during the step in which the charging and that imaging exposure are conducted simultaneously for forming the electrostatic latent image and is continued for a

time, at the shortest, until the levels of potential in the regions of said photosensitive device in which the dark and bright portions of such image have been formed are equalized, and

wherein the quantity of light to which said photosensitive device is exposed in said first step is equal to or greater than the quantity of light applied in the step in which the charging and image exposure are conducted simultaneously in the process for forming the electrostatic latent image.

4,578,333

MULTILAYER PHOTOCONDUCTIVE ELEMENTS HAVING AN ACRYLONITRILE COPOLYMER INTERLAYER

William J. Staudenmayer, Pittsford; Tsang J. Chen, Rochester; Paul M. Borsenberger, Hilton, and Hans R. Grashof, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 495,227, May 16, 1983, abandoned. This application Aug. 24, 1984, Ser. No. 643,768

Int. Cl.[4] G03G 5/14

U.S. Cl. 430—60 18 Claims

1. In a photoconductive element comprising an electrically conductive support, a charge generating layer containing a photoconductive pigment, a charge transport layer, and an interlayer between the conductive support and the charge generating layer, the improvement wherein the interlayer comprises an acrylonitrile copolymer.

4,578,334

MULTI-ACTIVE PHOTOCONDUCTIVE INSULATING ELEMENTS AND METHOD FOR THEIR MANUFACTURE

Paul M. Borsenberger, Hilton; Michael T. Regan, and William J. Staudenmayer, both of Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 23, 1984, Ser. No. 674,197

Int. Cl.[4] G03G 5/06, 5/14

U.S. Cl. 430—59 22 Claims

16. A multi-active photoconductive insulating element exhibiting very high electrophotographic speed, panchromatic sensitivity, and low contrast,

said element having at least two active layers comprising a charge-generation layer in electrical contact with a charge-transport layer;

said charge-generation layer:

(a) containing a crystalline form of N,N'-bis(2-phenethyl)-perylene-3,4:9,10-bis-(dicarboximide) which is capable, upon exposure to activating radiation, of generating and injecting charge carriers into said charge-transport layer,

(b) exhibiting a first spectral absorption peak at approximately 430 nm and a second spectral absorption peak at approximately 620 nm, and

(c) having a prominent line at a 2θ angular position of 23 degrees in the X-ray diffraction pattern obtained with CuK α radiation; and

said charge-transport layer being an organic composition comprising a polymeric binder and, as a charge-transport agent, a polynuclear tertiary aromatic amine which is capable of accepting and transporting injected charge carriers from said charge-generation layer.

4,578,335

INTERLEUKIN 2 RECEPTOR

David L. Urdal; Carl J. March, and Steven K. Dower, all of Seattle, Wash., assignors to Immunex Corporation, Seattle, Wash.

Filed May 21, 1984, Ser. No. 612,559

Int. Cl.[4] C12P 21/00; C07K 3/02

U.S. Cl. 435—68 10 Claims

1. A process for producing a homogeneous receptor for interleukin 2, comprising:

(a) culturing cells capable of expressing interleukin 2 receptor molecules in culture medium;

(b) harvesting said cells from the culture medium;

(c) extracting the interleukin 2 receptor molecules from said cells; and

(d) purifying said interleukin 2 receptor molecules with a reversed phase, high-performance liquid chromatography column containing methyl groups covalently bonded to silica gel whereby the interleukin 2 receptor molecules are retained by the column.

4,578,336

PRODUCING NUCLEOSIDES

Yasuhiro Sumino, Kobe; Koji Sonoi, Suita, and Muneharu Doi, Takarazuka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Nov. 24, 1982, Ser. No. 444,457

Claims priority, application Japan, Nov. 27, 1981, 56-191033

Int. Cl.[4] C12P 19/40

U.S. Cl. 435—88 1 Claim

1. A method of producing inosine or guanosine or both inosine and guanosine, comprising cultivating an adenine-requiring microorganism capable of producing inosine or guanosine or both inosine and guanosine, selected from the group consisting of *Bacillus pumilus* No. 148-S-16 (FERM BP-6, IFO 12483), *Bacillus pumilus* No. 158-A-17 (FERM BP-7, IFO 12477), *Bacillus subtilis* ATCC 19221 (IFO 14123) and *Bacillus subtilis* ATCC 13956 (IFO 14124), in a culture medium containing a source of adenine selected from the group consisting of adenine, adenosine, 5'-adenosine monophosphate, 3'-adenosine monophosphate, 5'-adenosine diphosphate, 5'-adenosine triphosphate, ribonucleic acid, deoxyribonucleic acid, adenylosuccinic acid, microbial cells, extracts of microbial cells, beef extract, and fish flesh extract, to cause said microorganism to elaborate and accumulate inosine or guanosine or both inosine and guanosine in a fermentation broth; and recovering the inosine or guanosine or both inosine and guanosine from said broth,

wherein the improvement comprises incorporating said source of adenine in said medium in an excess amount over the amount of adenine that would be conducive to a maximum yield of inosine or guanosine or both inosine and guanosine in an aerobic culture if air were used, the amount of said source of adenine in said medium being 200 to 800 μg/ml as adenine, and cultivating said microorganism while air and oxygen are bubbled into said medium in accordance with the following equations:

$$Q_{AIR} = \frac{100 - C}{79} \times Q_o$$

$$Q_{OXYGEN} = \frac{C - 21}{79} \times Q_o$$

wherein Q_{AIR} and Q_{OXYGEN} are the amounts (VVM) of air and oxygen, respectively, that are supplied to said medium, Q_o is 0.2 to 5 VVM, which is the feed amount of air in a conventional process and C is the oxygen concentration (%) of a gaseous mixture of oxygen and air, which is arbitrarily determined to be not less than the value C_o calculated from the following experimental equation:

$$C_o = Ad \times 10^3$$

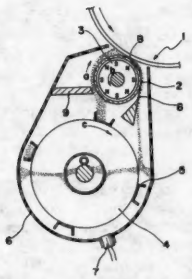
wherein C_o represents the minimum oxygen concentration (%) of a gaseous mixture of oxygen and air, which is needed to obtain the maximum accumulation yield of inosine or guanosine or both inosine and guanosine when the adenine equivalent concentration of adenine source in the medium is Ad (weight/volume, %).

4,578,337

DRY PROCESS FOR DEVELOPING ELECTROSTATIC LATENT IMAGES WITH A DEVELOPER COMPRISING TWO KINDS OF MAGNETIC CARRIERS HAVING DIFFERENT PHYSICAL STRUCTURE

Tateki Oka, Toyohashhi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 16, 1984, Ser. No. 600,409
Claims priority, application Japan, Apr. 15, 1983, 58-67488
Int. Cl.[4] G03G *9/08, 9/10, 9/14*
U.S. Cl. 430—107 15 Claims



1. A process for developing electrostatic latent images comprising using a dry magnetic developer comprising an insulating toner and magnetic carriers, said magnetic carriers comprising a ferromagnetic carrier composed of a ferromagnetic material and a binder-type magnetic carrier, said ferromagnetic carrier being composed of resin-coated ferromagnetic material or bare particles of a ferromagnetic material of soft type, said binder-type magnetic carrier being composed of particles of a powdered magnetic material dispersed in a thermoplastic resin binder and having a coercive force greater than that of the ferromagnetic carrier.

4,578,338

DEVELOPMENT PROCESS WITH TONER COMPOSITION CONTAINING LOW MOLECULAR WEIGHT WAXES

Robert J. Gruber, Pittsford; Ronald J. Koch, Webster, and John F. Knapp, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 31, 1984, Ser. No. 645,892
Int. Cl.[4] G03G *13/14*
U.S. Cl. 430—120 26 Claims

1. An improved process for the development and fixing of electrostatic latent images consisting essentially of (1) generating an electrostatic latent image on a photoconductive imaging member, (2) developing this image with a toner composition comprised of toner resin particles, pigment particles, and a wax component of a molecular weight of from about 500 to about 20,000, (3) transferring the developed image to a suitable substrate, and subsequently (4) fusing the transferred image with a compliant oil fuser roll, wherein the amount of fuser oil consumed is from about one microliter to about three microliters per page of developed image.

4,578,339

PHOTOSENSITIVE IMAGING SYSTEM EMPLOYING OIL-CONTAINING MICROCAPSULES

David G. Adkins, Chillicothe, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Aug. 23, 1984, Ser. No. 643,565
Int. Cl.[4] G03C *1/68, 5/54, 7/00;* B01J *13/02*
U.S. Cl. 430—138 16 Claims

1. A photosensitive transfer imaging system comprising an imaging sheet and a developer sheet;

said imaging sheet including:

a photographic support;

a layer of photosensitive microcapsules on one surface of said support;

said microcapsules having a discrete capsule wall which encapsulates, as a first internal phase, a chromogenic material, and a photosensitive composition which undergoes a change in viscosity upon exposure to actinic radiation;

said developer sheet including:

a support member, and

a layer of a developer composition on one surface of said support member,

said developer composition being capable of reacting with said chromogenic material and generating a color image;

at least one of said imaging sheet and said developer sheet carrying a plurality of oil-containing microcapsules codeposited on the reactive surface thereof with said photosensitive microcapsules or said developer material, said oil-containing microcapules having a discrete capsule wall which encapsulates a second internal phase, said second internal phase consisting essentially of an oil in which said chromogenic material is soluble, said oil having a viscosity less than the viscosity of said first internal phase;

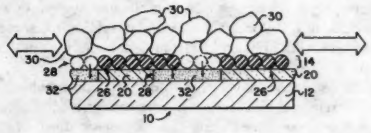
said imaging system being capable of forming images by image-wise exposing said imaging sheet to actinic radiation, assembling said imaging sheet and said developer sheet with their reactive surfaces in contact, and subjecting said photosensitive microcapsules to a uniform rupturing force, said photosensitive microcapsules thereby image-wise releasing said first internal phase containing said chromogenic material to said developer sheet where said chromogenic material and said developer react to form an image; and said oil-containing microcapsules rupturing and releasing said second internal phase, said second internal phase thereupon mixing with said first internal phase and reducing the viscosity of said first internal phase and thereby enhancing image formation.

4,578,340

FREE PARTICLE ABRASION DEVELOPMENT OF IMAGING SHEETS EMPLOYING PHOTOSENSITIVE MICROCAPSULES

Edward J. Saccocio, Columbus; T. Kay Kiser, Chillicothe; Richard F. Wright, Chillicothe, and Donald L. Head, Chillicothe, all of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Nov. 13, 1984, Ser. No. 670,447
Int. Cl.[4] G03C *1/72;* G03D *13/00, 13/04;* B32B *5/16*
U.S. Cl. 430—138 11 Claims



1. A method of rupturing photosensitive microcapsules which form a photosensitive layer on the surface of an imaging sheet comprising the steps of:

forming a body of free particles; and

establishing relative movement between said sheet and said body of free particles such that said free particles move over said microcapsules on the surface of said sheet and thereby rupture said microcapsules.

4,578,341

ACIDIC PHOTOSENSITIVE RELIEF IMAGE-FORMING MATERIALS WITH INDICATOR PIGMENT OR DYE

Peter B. Readings, Chertsey; Nandor Mihalik, Walton-on-Thames, and Robin Taylor, Frimley Green, all of England, assignors to Sensitisers (Research) Ltd., Deepcut, England

Continuation of Ser. No. 358,665, Mar. 16, 1982, abandoned. This application Aug. 3, 1984, Ser. No. 636,810

Claims priority, application United Kingdom, Mar. 24, 1981, 8109098

Int. Cl.[4] G03C *1/60, 1/71, 1/68, 1/76*

U.S. Cl. 430—155 **14 Claims**

1. A relief-image forming material comprising a substrate having an acidic photosensitive layer thereon, said layer comprising in admixture a photosensitive component, selected from the group consisting of light-hardening components, light-solubilising components and components that upon exposure to actinic light are solubilised to one solvent and rendered insoluble in another solvent, and an indicator, being a substance selected from pigments and dyes capable of existing in two states that differ in actinic opacity relative to light of at least one given wavelength in the range of from 360 to 540 nm depending on pH, said indicator being in a state of lower actinic opacity in the unexposed material and being capable of remaining in substantially such a state during exposure to actinic light and of shifting to a state of higher actinic opacity after exposure to actinic light upon a shift of the pH of the photosensitive layer to a higher pH value, said indicator being present in an amount effective to produce, after the shift to its state of higher actinic opacity and after removal of a portion of said layer, a relief image having an actinic opacity corresponding to a transmission density greater than 2 as measured on a Macbeth densitometer using a filter that transmits light at said given wavelength.

4,578,342

PRESENSITIZED DIAZO LITHOGRAPHIC PLATE WITH ANODIZED AND SILICATED ALUMINUM PLATE SURFACE AND SUBBING LAYER OF POLYMER WITH SULFONIC ACID GROUP

Toshiyuki Sekiya, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 2, 1983, Ser. No. 557,303

Claims priority, application Japan, Dec. 2, 1982, 57-211942

Int. Cl.[4] G03C *1/60, 1/94*

U.S. Cl. 430—159 **23 Claims**

1. A presensitized lithographic plate, comprising:

an anodized aluminum support treated with a sodium silicate aqueous solution;

a subbing layer provided on said support, wherein said subbing layer comprises a high molecular weight compound containing sulfonic acid group-containing monomer units as recurring units and has a molecular weight in the range of 1000 to about 1,000,000; and

a light-sensitive layer provided on said subbing layer, wherein said light-sensitive layer comprises, in admixture, a diazo resin condensate of an aromatic diazo compound and an active carbonyl or active ether compound, and an organic high molecular weight binder; wherein the amounts of said condensate and said binder are in the range of 3 to 30 wt % and 97 to 70 wt %, respectively, based on the total weight of the condensate and the binder.

4,578,343

METHOD FOR PRODUCING FIELD EFFECT TYPE SEMICONDUCTOR DEVICE

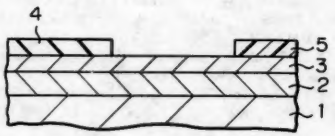
Kinjiro Kosemura, Atsugi; Yoshimi Yamashita, Sagamihara; Noriaki Nakayama, Ebina, and Sumio Yamamoto, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 533,977, Sep. 20, 1983, abandoned. This application Mar. 28, 1985, Ser. No. 717,477

Claims priority, application Japan, Sep. 21, 1982, 57-163063

Int. Cl.[4] G03C *5/00*

U.S. Cl. 430—296 **9 Claims**



1. A method for producing a field effect type semiconductor device comprising the steps of:

(a) forming a semiconductor active layer on a substrate;

(b) forming source and drain electrodes on the semiconductor active layer;

(c) forming a resist layer on the semiconductor active layer and the source and drain electrodes;

(d) exposing a first portion of the resist layer in accordance with a gate electrode pattern;

(e) carrying out auxiliary exposure of a second portion of the resist layer adjacent the first portion after or before the exposure of the first portion of the resist layer in said step (d);

(f) developing the exposed resist layer to form an upper opening of the resist layer in accordance with the gate electrode pattern and a lower opening of the resist layer in accordance with the exposure of the first and second portions, the cross-section of the opening of the resist layer in the source-drain direction being asymmetrically enlarged by the developing process in the area near the drain electrode;

(g) forming a recess in the semiconductor active layer by etching the exposed semiconductor active layer through the lower opening of the resist layer using the resist layer as a mask, the recess having an asymmetric structure and being enlarged, with respect to the upper opening, in the area near the drain electrode; and

(h) forming a gate electrode on the surface of the recess using the resist layer as a mask, the position of the gate electrode being closer to the source electrode than to the drain electrode and being aligned with the edges of the upper opening.

4. A method according to claim 1, wherein said steps (a) and (e) of exposing the resist layer each comprise the substep of irradiating the resist layer with an electron beam.

4,578,344

PHOTOLITHOGRAPHIC METHOD USING A TWO-LAYER PHOTORESIST AND PHOTOBLEACHABLE FILM

Bruce F. Griffing, Schenectady, and Paul R. West, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 20, 1984, Ser. No. 684,395

Int. Cl.[4] G03C *5/00*

U.S. Cl. 430—312 **4 Claims**

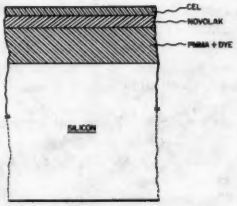
1. In a photolithographic method of forming a patterned photoresist relief from a two-layer photoresist which comprises,

(1) depositing a first resist on a substrate to produce a bottom resist layer having a substantially planar top surface, and

depositing a second resist as a top resist layer producing a multilayer substrate coating having the bottom resist layer sandwiched between the substrate and the top resist layer and

(2) exposing the top resist layer to light in a range in which the second resist is insensitive, said light having been passed through a mask to expose only selected portions of the top resist layer and

(3) thereafter developing the top layer to produce a portable conformable mask and the layers of the substrate coating other than the top resist layer processed to replicate the pattern of this portable conformable mask to such layers,



whereby an incomplete resolution of the lower photoresist layer is obtained due to variations in the profile and thickness of the upper photoresist pattern, the improvement which comprises, applying a photobleachable film comprising an arylnitrone and an inert organic polymer binder onto the surface of the upper photoresist layer prior to exposing the two-layer photoresist to patterned UV light, whereby reducing the variations and thickness of the resulting portably conformable mask obtained from the development of the exposed upper photoresist layer and thereby improving the resolution of the resulting patterned photoresist relief obtained from the subsequent exposure and development of lower photoresist layer.

4,578,345

METHOD FOR PROCESSING COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Shigeru Ohno; Shinzo Kishimoto; Akihiko Ikegawa, and Morio Yagihara, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

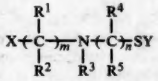
Filed Oct. 24, 1984, Ser. No. 664,176

Claims priority, application Japan, Oct. 31, 1983, 58-204591

Int. Cl.[4] G03C 7/00

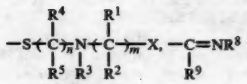
U.S. Cl. 430—393 **24 Claims**

1. A method for processing a color photographic light-sensitive material by subjecting an exposed silver halide color photographic light-sensitive material to color development then to bleaching and fixing or then to bleach-fixing, which method comprises using a ferric ion complex salt or a persulfate as a bleaching agent in the bleaching or bleach-fixing and incorporating at least one compound selected from compounds represented by general formula (I) below and a salt thereof in a bleaching bath, bleach-fixing bath or in a prebath thereof:



(I)

wherein X represents —COOM, —OH, —SO_3M, —$CONH_2$, —SO_2NH_2, —NH_2, —SH, —CN, —CO_2R^6, —SO_2R^6, —OR^6, —NR^6R^7, —SR^6, —SO_3R^6, —$NHCOR^6$, —$NHSO_2R^6$, —$OCOR^6$ or —OSO_2R^6; Y represents



or a hydrogen atom; m and n each represents an integer from 1 to 10; R^1, R^2, R^4, R^5, R^7 and R^8 each represents a hydrogen atom or a lower alkyl group, R^3 represents a hydrogen atom, a lower alkyl group, an acyl group or

R^6 represents a lower alkyl group; R^9 represents —$NR^{10}R^{11}$, —OR^{12} or —SR^{12}; R^{10} and R^{11} each represents a hydrogen atom or a lower alkyl group; R^{12} represents an atomic group necessary to complete a ring by being connected with R^8; R^{10} or R^{11} may be connected with R^8 to form a ring; and M represents a hydrogen atom or a cation.

4,578,346

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS

Toshiyuki Watanabe; Morio Yagihara, and Keiichi Adachi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 571,762, Jan. 18, 1984, abandoned. This application Jan. 30, 1985, Ser. No. 696,545

Claims priority, application Japan, Jan. 19, 1983, 58-7151

Int. Cl.[4] G03C 7/26

U.S. Cl. 430—548 **33 Claims**

1. A silver halide color photographic light-sensitive material, comprising:

a support having thereon;

a silver halide emulsion layer containing a non-polymeric, non-diffusion coupler which couples with an oxidation product of a developing agent during development processing to form a dye of such mobility that controlled image smearing occurs; and;

a silver halide emulsion layer containing a polymer coupler latex, the silver halide emulsion layer containing the polymer coupler latex being adjacent to the silver halide emulsion layer containing the non-polymeric, non-diffusion coupler.

4,578,347

SUPERSENSITIZATION OF SILVER HALIDE EMULSIONS

James B. Philip, Jr., St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 29, 1984, Ser. No. 645,344

Int. Cl.[4] G03C 1/02

U.S. Cl. 430—572 **25 Claims**

1. A silver halide photographic emulsion in a hydrophilic colloidal binder, said emulsion being spectrally sensitized by a spectral sensitizing dye to at least a portion of the electromagnetic spectrum and having a supersensitizing amount of a water-soluble triaryl compound selected from the group consisting of phosphines, amines, arsines, bismuthines and stibylidynes.

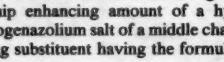
4,578,348

HYDROLYZED AZOLIUM SPEED ENHANCING/FOG-INHIBITING AGENTS FOR SILVER HALIDE PHOTOGRAPHY

John P. Freeman; Fred M. Macon, and John D. Mee, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 18, 1985, Ser. No. 712,495
Int. Cl.[4] G03C 1/34
U.S. Cl. 430—607 18 Claims

1. A photographic element containing a radiation sensitive silver halide emulsion and a fog inhibiting, speed/fog relationship enhancing amount of a hydrolyzed quaternized chalcogenazolium salt of a middle chalcogen including a quaternizing substituent having the formula:



where:

L is a divalent linking group;

R is a hydrocarbon residue or an amino group;

T and T^1 are independently carbonyl or sulfonyl and

m is an integer of from 1 to 3.

4,578,349

IMMUNOASSAY FOR CARCINOEMBRYONIC ANTIGEN (CEA)

Steven D. Schaffel, Wheeling, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Apr. 8, 1982, Ser. No. 366,492
Int. Cl.[4] G01N 33/54, 33/56
U.S. Cl. 435—7 3 Claims

1. In an immunoassay for carcinoembryonic antigen in biological fluid, which immunoassay comprises the steps of contacting the biological fluid with antibody to carbinoembryonic antigen and determining the extent of antibody binding to the carcinoembryonic antigen, the improvement comprising liberating carcinoembryonic antigen in the biological fluid by diluting the biological fluid with a diluent comprising a 0.4–0.8 molar salt solution buffered at a pH within the range of from 6 to 8, prior to conducting the immunoassay for carcinoembryonic antigen.

4,578,350

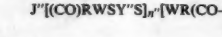
IMMUNOASSAYS EMPLOYING PROTECTED LABELS

Richard D. Armenta, Mountain View, and Ian Gibbons, Menlo Park, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Sep. 23, 1983, Ser. No. 535,452
Int. Cl.[4] G01N 53/00; C12N 9/96
U.S. Cl. 435—7 19 Claims

1. In a method for the determination of the presence of an analyte in serum wherein the serum is combined with a receptor for a ligand and a conjugate of the ligand and an enzyme label and the amount of analyte is related to the amount of enzyme activity in said combination and wherein the serum contains endogenous components other than analyte which cause a diminution of the enzyme activity, the improvement which comprises binding said enzyme label to a label protectant wherein said label protectant is a compound selected from the group consisting of saccharides and animal derived plasma proteins having a molecular weight of about 20,000–100,000 and having an electronic charge similar to that of the conjugate of the ligand and the enzyme label.

17. A compound of the formula:



wherein:

J" is a protein having a molecular weight of about 400,000–600,000 daltons;

R is an aliphatic linking group of from 1 to 12 carbon atoms;

W is derived from an activated olefin group, for reaction with a thiol group, having from 4 to 10 atoms comprising carbon, chalocogen of atomic number 8 to 16, and nitrogen;

SY"S is β-galactosidase;

n" is either 3 or 4;

Z" is albumin; and

m' is a number of at least 1 per SY"S.

4,578,351

PRODUCTION OF CHEMICAL COMPOUNDS WITH IMMOBLIZED PLANT CELLS

Alan Rosevear, and Christopher A. Lambe, both of Wantage, England, assignors to United Kingdom Atomic Energy Authority, England

Continuation of Ser. No. 361,107, Mar. 23, 1982, abandoned. This application Jun. 20, 1984, Ser. No. 622,761
Claims priority, application United Kingdom, Apr. 21, 1981, 8110421
The portion of the term of this patent subsequent to Jun. 5, 2001, has been disclaimed.
Int. Cl.[4] C12P 1/00, 33/00, 21/00; C12N 11/04
U.S. Cl. 435—41 9 Claims

9. A composite material suitable for use in the production of intra-cellular secondary metabolites, comprising a support material, a permeable modified polyacrylamide gel retained on the support material and, viable plant cells immobilised in the permeable gel, said modified polyacrylamide gel containing a minor amount of a polymeric material selected from the group consisting of xanthan gum and sodium alginate, said cells being at a point in their growth cycle where secondary metabolism is established such that the intra-cellular secondary metabolites can be produced in the cells and said cells being maintained in sufficiently close proximity by the permeable gel that the cells can excrete the intra-cellular secondary metabolites produced in the cells.

4,578,352

NOVEL THERMOSTABLE, ACIDURIC ALPHA-AMYLASE AND METHOD FOR ITS PRODUCTION

Dennis M. Katkocin, Danbury, Conn.; Nancy S. Word, Woodridge, and Shiow-Shong Yang, Downers Grove, both of Ill., assignors to CPC International Inc., Englewood Cliffs, N.J.

Filed Jul. 13, 1983, Ser. No. 513,517
Int. Cl.[4] C12P 19/14; C12N 9/28; C12R 1/145
U.S. Cl. 435—99 5 Claims

1. An alpha-amylase enzyme derived from a *Clostridium thermoamylolyticum* microorganism, said enzyme having a molecular weight of about 75,000±3,000 as determined by SDS-polyacrylamide gel electrophoresis, having a half-life of greater than 70 hours at pH 4.2 and 60° C. in the presence of 5 mM Ca^{++}, having a maximum alpha-amylase activity at a pH of about 5.0 and having a maximum alpha-amylase activity at pH 4.5 at about 85° C.

4,578,353

FERMENTATION OF GLUCOSE WITH RECYCLE OF NON-FERMENTED COMPONENTS

Per G. Assarsson, Toronto, and Joseph H. Nagasuye, Mississauga, both of Canada, assignors to St. Lawrence Reactors Limited, Mississauga, Canada

Continuation-in-part of Ser. No. 399,228, Jul. 19, 1982, Pat. No. 4,497,896. This application Jan. 30, 1985, Ser. No. 697,395
The portion of the term of this patent subsequent to Feb. 5, 2002, has been disclaimed.
Int. Cl.[4] C12P 7/06, 7/10
U.S. Cl. 435—161 9 Claims

1. A process for producing fermentation products from carbohydrate material which comprises preparing an aqueous slurry feed of carbohydrate material, said slurry containing

about 15–30% by weight of carbohydrate solids, continuously moving said slurry feed through a single hydrolysis stage in which the slurry feed is moved through a confined tubular preheat zone and sufficient heat is transferred to the slurry whereby it passes through a gelation stage and forms into a hot free flowing liquid and said hot liquid is immediately forced through a restrictive opening and into a confined tubular reaction zone accompanied by a sudden decrease in pressure at a rate sufficient that the carbohydrate material is made highly reactive, and continuously moving the highly reactive carbohydrate material, together with an acid hydrolyzing agent, through the tubular reaction zone to produce a hydrolyzate in fluid form containing at least 80% glucose, fermenting the glucose-containing fluid to form a fermentation product, distilling the fermentation product to separate the product from a distillation residue containing non-fermented carbohydrate materials, and recycling at least part of the obtained distillation residue containing non-fermented carbohydrate materials to form part of the slurry feed to said single hydrolysis stage whereby a substantial portion of said non-fermented materials is hydrolyzed to form part of said fermentable glucose-containing fluid.

4,578,354
IMMOBILIZATION OF CATALYTICALLY ACTIVE MICROORGANISMS IN AGAR GEL FIBERS

John J. Cannon, Groton, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed May 9, 1983, Ser. No. 492,780
Int. Cl.⁴ C12N *11/10*
U.S. Cl. 435—178 **14 Claims**

1. A process for immobilizing enzyme-containing microbial cells comprising:

(a) contacting enzyme-containing microbial cells with an aqueous agar solution at a temperature of from about 40° to 60° C.; said agar containing from about 1.0 to 8.0% sulfate moiety on a weight/weight basis;

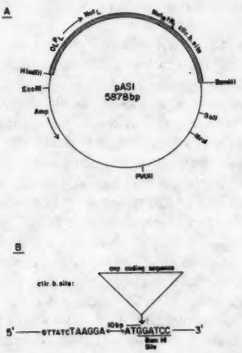
(b) contacting a 0.10 to 5.0 molar solution of inorganic sodium salts at a temperature of from about 0° to 20° C. with a stream of the mixture formed in a) above whereby agar fibers containing cells are formed; and

(c) recovering said cell-containing agar fibers.

4,578,355
PLASMID CLONING VECTOR PAS1

Martin Rosenberg, Malvern, Pa., assignor to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Jan. 12, 1983, Ser. No. 457,352
Int. Cl.⁴ C12N *1/00, 15/00;* C12P *21/00*
U.S. Cl. 435—317 **4 Claims**

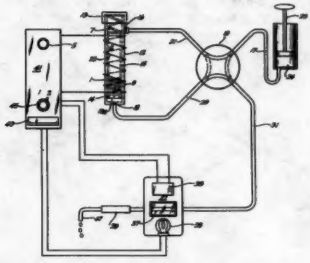


4. A plasmid vector capable of expressing a polypeptide comprising a plasmid containing in sequence a P_L promoter and a Nut L site from pKC30; and downstream from said Nut L site is a Nut R site, a tR1 site, a cII ribosome binding site including a cII translation initiation codon from λ DNA, and a BamHI site.

4,578,356
FIELD SOURCE ROCK EVALUATION METHOD

Stephen R. Larter, Lake Elsinore, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 494,725, May 16, 1983, Pat. No. 4,485,071.
This application Jul. 23, 1984, Ser. No. 614,308
Int. Cl.⁴ G01N *25/14, 33/24*
U.S. Cl. 436—31 **18 Claims**



1. A method for determining the hydrocarbon potential of a source rock comprising hydrocarbons and insoluble organic material capable of generating hydrocarbons upon pyrolysis or further maturation consisting essentially of the steps of,

(a) slurrying a particulate sample of said source rock with a first solvent for the hydrocarbons present in said source rock,

(b) removing a first solution comprising said hydrocarbons dissolved in said first solvent from said particulate sample,

(c) slurrying the particulate sample of step (b) with a second solvent,

(d) heating the slurry of step (c) to a temperature sufficient to pyrolyze the insoluble organic material in said source rock and provide a second solution of hydrocarbons dissolved in said second solvent, and

(e) analyzing said first and second solutions for hydrocarbons as a measure of the hydrocarbon potential of said source rock.

4,578,357
STABILIZED WATER INDICATING PASTE COMPOSITION

Frank W. Melpolder, Wallingford, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jun. 27, 1983, Ser. No. 507,856
Int. Cl.⁴ C09K *3/00;* G01N *33/18, 5/02*
U.S. Cl. 436—39 **12 Claims**

1. A visual indicating paste composition for producing a detectable color change upon contact with an aqueous solution, said composition exhibiting long shelf life, comprising (i) a water soluble indicator dye capable of changing color in the pH range between about 7 and about 11, (ii) an inorganic base in the form of a caustic powder dispersed in a polyalkylene gylcol liquid carrier selected from the group consisting of an aliphatic polyol, an alkylene glycol, a polyalkylene glycol, and mixtures thereof, and capable of absorbing water but which is not rapidly leached by water or hydrocarbon, (iii) a gelling agent, and (iv) a boron-containing compound which is miscible with or soluble in said carrier and capable of being hydrolyzed

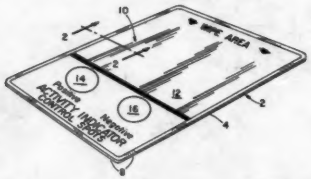
upon contact with water to yield boric acid or a salt thereof, present in a moisture inhibiting amount.

4,578,358

COLLECTION OF SPECIMENS AND DETECTION OF OCCULT BLOOD THEREIN

Norman H. Oksman, Mount Vernon, N.Y.; Joseph M. Talmage, Landing, N.J., and Henry J. Wells, Beaumont, Tex., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed May 3, 1983, Ser. No. 491,007
Int. Cl.[4] G01N *1/02, 33/52, 33/72*
U.S. Cl. 436—66 **10 Claims**



1. A process for collecting a specimen of a bodily substance and testing the specimen for occult blood comprising the steps of:

(a) contacting a specimen-collection region of an occult blood indicator wipe with a bodily substance to collect a specimen of the substance on the specimen-collection region of the wipe, the indicator wipe being made of a pliable pad comprising a plurality of sheets of absorbent, porous, soft material disposed one on top of another and joined together around their periphery to form a multilayer structure having sufficiently low wet strength to permit the wipe to be disposed of in a toilet, said pad including a first outermost sheet providing an occult-blood detection-test surface and a second outermost sheet providing a hand-contact surface a first region of said occult-blood detection-test surface being said specimen-collection region, and wherein a peroxidase-activity indicator reagent, in an amount sufficient to react with occult blood in the presence of an oxidizing-agent developing fluid to produce a color, is located between said first and second outermost sheets at or proximate to said specimen-collection region and said first and second outermost sheets are free of said indicator reagent, the pliable pad having a size and form to be manipulated by hand;

(b) subsequently applying an amount of an oxidizing-agent developing fluid to the specimen-collection region of the indicator wipe and observing any change in color after a predetermined period of time to determine if the specimen of bodily substance contains occult blood, providing that the peroxidase-activity indicator reagent, the oxidizing-agent developing fluid and the amount thereof, and the material of construction and number of said sheets of said pad are selected such that the wipe has a sufficiently high resistance to seepage by the oxidizing-agent developing fluid to permit the hand-contact surface of the indicator wipe to remain dry during said predetermined period to time;

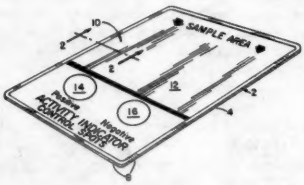
(c) by subsequently placing the entire indicator wipe in a toilet bowl and flushing the toilet to dispose of the specimen of bodily substance and the indicator wipe.

4,578,359

OCCULT-BLOOD DETECTION

Norman H. Oksman, Mount Vernon, N.Y.; Joseph M. Talmage, Landing, N.J., and Henry J. Wells, Beaumont, Tex., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed May 3, 1983, Ser. No. 491,008
Int. Cl.[4] G01N *1/02, 33/52, 33/72*
U.S. Cl. 436—66 **11 Claims**



1. A process for testing for occult blood in fecal matter employing an occult blood indicator fluid, the process comprising:

(a) contacting fecal matter or an anal area with a specimen-collection region of a guaiac-free specimen-collection wipe to collect a specimen of fecal matter on the wipe, the wipe being made of a pliable pad comprising a plurality of sheets of absorbant, porous, soft material disposed one on top of another and joined together around their periphery to form a multilayer structure having sufficiently low wet strength to permit the wipe to be disposed of in a toilet, said pad including a first outermost sheet providing an occult-blood detection-test surface and a second outermost sheet providing a hand-contact surface, a first area of said occult-blood detection-test surface being said specimen-collection region and a second area of said occult-blood detection-test surface being an indicator-activity verification region, said indicator-activity verification region having an indicator-activity test reagent therein, and said indicator-activity test reagent being capable of interacting with an occult-blood indicator fluid to provide a color indication when the occult-blood indicator fluid is sufficiently active to provide a color in the presence of occult blood;

(b) applying an amount of an occult-blood indicator fluid to the indicator-activity verification region of the wipe and observing any change in color after a predetermined period of time to verify whether or not the occult-blood indicator fluid is sufficiently active to provide a color in the presence of occult blood;

(c) applying an amount of the occult-blood indicator fluid of step (b) to the specimen of fecal matter on the specimen-collection region of the wipe at about the same time as applying the occult-blood indicator fluid to the indicator-activity verification region and observing any change in color after said predetermined period of time to determine if the fecal matter contains occult blood, providing that the occult-blood indicator fluid and the amounts thereof, and the material of construction and number of said sheets of said pad are selected such that the wipe has a sufficiently high resistance to seepage by the occult-blood indicator fluid applied in steps (b) and (c) to permit the hand-contact surface of the wipe to remain dry during said predetermined period of time; and

(d) flushing the entire wipe down a toilet to dispose of the wipe.

4,578,360

SPECIFIC BINDING ASSAY CONJUGATE WITH SPACED-APART RECEPTORS

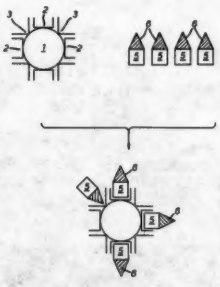
David S. Smith, London, England, assignor to Technicon Instruments Co. Ltd., England

Division of Ser. No. 230,477, Feb. 2, 1981, Pat. No. 4,401,764. This application Nov. 29, 1982, Ser. No. 445,344

Claims priority, application United Kingdom, Feb. 7, 1980, 8004090

Int. Cl.[4] G01N *33/54*

U.S. Cl. 436—518 10 Claims



1. A specific binding assay conjugate which comprises at least one analyte-specific receptor linked with a label-specific receptor in spaced relationship through at least one linking group such that a labeled analyte or analyte analog cannot simultaneously bind with the analyte-specific receptor and the label-specific receptor.

4,578,361

CREATININE ANTIBODY

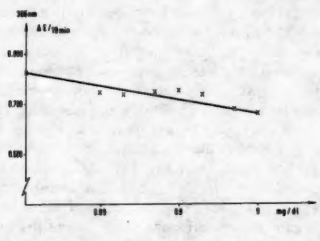
Joachim Siedel, Bernried; Ulrich Neumann, Peissenberg; Joachim Ziegenhorn, Starnberg; Hans-Georg Batz; Helmut Lenz, both of Tutzing; Brigitte Pautz, Herrsching, and Winfried Albert, Pähl, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Division of Ser. No. 412,411, Aug. 27, 1982. This application Oct. 2, 1984, Ser. No. 656,957

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1981, 3134787

Int. Cl.[4] G01N *33/54;* A61K *39/00;* C07G *7/00*

U.S. Cl. 436—547 16 Claims



1. A method of immunologically determining creatinine which comprises incubating, with a creatinine containing sample a purified creatinine specific antibody which forms a hapten-antibody complex with creatinine, reacting the thus produced mixture with a conjugate of creatinine, said conjugate comprising a hapten carrier substance, at least one of said antibody and said conjugate being present in dissolved form, the second component being present in either dissolved or solid phase form, under conditions favoring binding of said antibody with said creatinine and inhibition of binding of said antibody with said comjugate, measuring the amount of binding between conjugate and antibody and comparing said amount of binding to a standard obtained by binding antibody and conjugate when creatinine is not present, the difference in said amount of binding indicating the amount of creatinine present in said sample.

11. Reagent for immunological determination of creatinine comprising a purified antibody specific to creatinine, a conjugate of creatinine with hapten carrier substance, and a buffer substance.

4,578,362

PRECIOUS METAL VAPORIZATION REDUCTION

Gary B. A. Schuster, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 554,503, Nov. 23, 1983, Pat. No. 4,532,184. This application Apr. 1, 1985, Ser. No. 718,318

Int. Cl.[4] C03C *8/14, 3/087*

U.S. Cl. 501—17 2 Claims

1. A flame-spray composition for forming a dual phase coating used to decrease precious metal vaporization comprising:

(a) a refractory material which is selected from the group consisting of at least one of MgO, ZrO_2, Al_2O_3, TiO_2, Cr_2O_3, aluminides, silicides, borides or a combinations thereof, said refractory material having liquidus temperature greater than the temperature at which the precious metal is to operate, and

(b) a calciumaluminosilicate glass having a liquidus temperature less than the temperature at which the precious metal is to operate, said glass being present in an amount effective to decrease weight loss due to vaporization of said precious metal, said precious metal being selected from the group consisting of platinum, iridium, rhodium and combinations thereof.

4,578,363

SILICON CARBIDE REFRACTORIES HAVING MODIFIED SILICON NITRIDE BOND

Diego Campos-Loriz, Niagara Falls, N.Y., assignor to Kennecott Corporation, Cleveland, Ohio

Filed Jan. 23, 1984, Ser. No. 573,076

Int. Cl.[4] C04B *35/56*

U.S. Cl. 501—89 17 Claims

1. A bonded silicon carbide article consisting essentially of granular silicon carbide and a bond phase, said article being made by a process consisting essentially of:

(a) forming a uniform mixture consisting essentially of from about 4 to about 8 percent aluminum powder, from about 10 to about 16 percent silicon powder and the remainder being granular silicon carbide and optionally, a temporary binder;

(b) shaping the mixture into a green compact in the form of the article;

(c) firing the green compact in a non-oxidative nitrogeneous atmosphere at a temperature in excess of 1300° C. until substantially all of the silicon and aluminum is combined with nitrogen to complete formation of the article;

wherein the bond phase comprises from about 50 to 80 weight percent Si—Al—O—N, and contains from about 1½ to about 6½ weight percent oxygen based on the total weight of bond phase, and from about 6 to about 20 weight percent aluminum based on the total weight of bond phase.

4,578,364

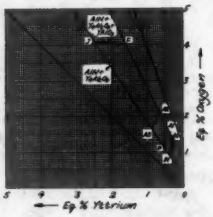
HIGH THERMAL CONDUCTIVITY CERAMIC BODY OF ALUMINUM NITRIDE

Irvin C. Huseby, Schenectady, and Carl F. Bobik, Burnt Hills, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 679,414, Dec. 7, 1984, abandoned. This application Apr. 29, 1985, Ser. No. 728,626

Int. Cl.[4] C04B *35/58;* F27D *7/06*

U.S. Cl. 501—98 37 Claims



1. A process for producing a sintered polycrystalline aluminum nitride ceramic body having a composition defined and encompassed by polygon P1JFA4 but not including lines JF and A4F of FIG. 4, a porosity of less than about 10% by volume of said body and a thermal conductivity greater than 1.00 W/cm.K at 25° C. which comprises the steps:

(a) forming a mixture comprised of oxygen-containing aluminum nitride powder, yttrium oxide, and free carbon, shaping said mixture into a compact, said mixture and said compact having a composition wherein the equivalent % of yttrium and aluminum ranges between points J and A4 of FIG. 4, said yttrium ranging from greater than about 0.3 equivalent % to less than about 2.5 equivalent %, said aluminum ranging from greater than about 97.5 equivalent % to less than about 99.7 equivalent %, said compact having an equivalent % composition of Y, Al, O and N outside the composition defined and encompassed by polygon P1JFA4 of FIG. 4,

(b) heating said compact in a nitrogen-containing nonoxidizing atmosphere at a temperature ranging from about 1350° C. to a temperature sufficient to deoxidize the compact but below its pore closing temperature reacting said free carbon with oxygen contained in said aluminum nitride producing a deoxidized compact, said deoxidized compact having a composition wherein the equivalent % of Al, Y, O and N is defined and encompassed by polygon P1JFA4 but not including lines JF and A4F of FIG. 4, said free carbon being in an amount which produces said deoxidized compact, and

(c) sintering said deoxidized compact in a nitrogen-containing nonoxidizing atmosphere at a temperature of at least about 1850° C. producing said polycrystalline body.

27. A polycrystalline body having a composition defined and encompassed by polygon P1JFA4 of FIG. 4 but excluding lines JF and A4F which is comprised of from greater than about 0.3 equivalent % yttrium to less than about 2.5 equivalent % yttrium, from greater than about 97.5 equivalent % aluminum to less than about 99.7 equivalent % aluminum, from about 0.85 equivalent % oxygen to less than about 4.1 equivalent % oxygen and from greater than about 95.9 equivalent % nitrogen to about 99.15 equivalent % nitrogen, said polycrystalline body having a porosity of less than about 10% by volume of said body and a thermal conductivity greater than 1.00 W/cm.K at 25° C.

36. A polycrystalline body having a phase composition comprised of AlN, $YAlO_3$ and $Y_4Al_2O_9$ wherein the total amount of $YAlO_3$ and $Y_4Al_2O_9$ phase ranges from greater than about 1.7% by volume to less than about 6.0% by volume of the total volume of said body, said $YAlO_3$ phase ranging from a trace amount to less than about 4.2% by volume of the sintered body, said $Y_4Al_2O_9$ phase ranging from a trace amount to less than about 6.0% by volume of the sintered body, said body having a porosity of less than about 10% by volume of said body and a thermal conductivity greater than 1.00 W/cm.K at 25° C.

37. The polycrystalline body according to claim 36 wherein said body contains carbon in an amount of less than 0.04% by weight of said body and has a porosity of less than about 1% by volume of said body and a thermal conductivity greater than 1.57 W/cm.K at 25° C.

4,578,365

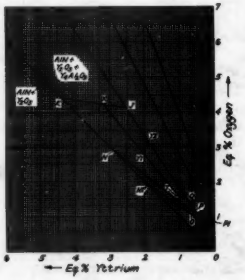
HIGH THERMAL CONDUCTIVITY CERAMIC BODY OF ALUMINUM NITRIDE

Irvin C. Huseby, Schenectady, and Carl F. Bobik, Burnt Hills, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 675,048, Nov. 26, 1984, abandoned. This application Apr. 29, 1985, Ser. No. 728,117

Int. Cl.[4] C04B *35/58;* F27D *7/06*

U.S. Cl. 501—98 46 Claims



1. A process for producing a sintered polycrystalline aluminum nitride ceramic body having a composition defined and encompassed by polygon P1N1KJ but not including lines KJ and P1J of FIG. 4, a porosity of less than about 10% by volume of said body and a thermal conductivity greater than 1.00 W/cm·K at 25° C. which comprises the steps:

(a) forming a mixture comprised of an oxygen-containing aluminum nitride powder, yttrium oxide, and free carbon, shaping said mixture into a compact, said mixture and said compact having a composition wherein the equivalent % of yttrium and aluminum ranges between points K and P1 of FIG. 4, said yttrium ranging from greater than about 0.35 equivalent % to less than about 4.4 equivalent %, said aluminum ranging from greater than about 95.6 equivalent % to less than about 99.65 equivalent %, said mixture and said compact having an equivalent % composition of Y, Al, O and N outside the composition defined and encompassed by polygon P1N1KJ of FIG. 4,

(b) heating said compact in a nitrogen-containing nonoxidizing atmosphere at a temperature ranging from about 1350° C. to a temperature sufficient to deoxidize the compact but below its pore closing temperature reacting said free carbon with oxygen contained in said aluminum nitride producing a deoxidized compact, said deoxidized compact having a composition wherein the equivalent % of Al, Y, O and N is defined and encompassed by polygon P1N1KJ but not including lines KJ and P1J of FIG. 4, said free carbon being in an amount which produces said deoxidized compact, and

(c) sintering said deoxidized compact in a nitrogen-contain-

ing nonoxidizing atmosphere at a temperature of at least about 1860° C. producing said polycrystalline body.

29. A polycrystalline aluminum nitride body having a composition defined and encompassed by polygon PONKJ but not including lines KJ and PJ of FIG. 4, a porosity of less than about 10% by volume of said body and a thermal conductivity greater than 1.00 W/cm·K at 25° C.

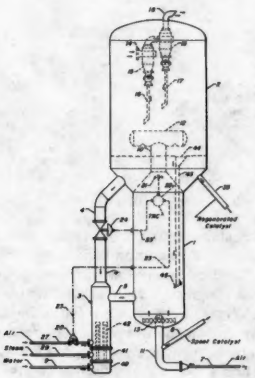
30. A polycrystalline aluminum nitride body having a composition defined and encompassed by polygon QTXJ but not including lines QJ and XJ of FIG. 4, a porosity of less than about 10% by volume of said body and a thermal conductivity greater than 1.00 W/cm·K at 25° C.

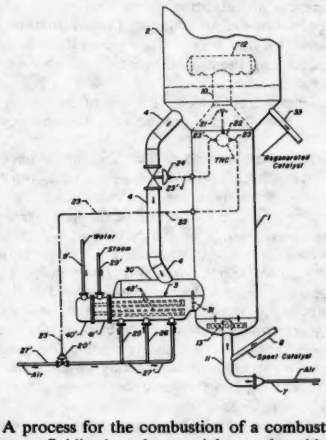
4,578,366

FCC COMBUSTION ZONE CATALYST COOLING PROCESS

Ismail B. Cetinkaya, Mt. Prospect, and Daniel N. Myers, Arlington Heights, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Dec. 28, 1984, Ser. No. 687,352
Int. Cl.⁴ B01J *21/20*; C10G *11/18*
U.S. Cl. 502—6 **8 Claims**





1. A process for the combustion of a combustible material present on fluidized catalyst particles employed in a hydrocarbon conversion process which comprises the steps of:

(a) introducing a first stream of oxygen-containing combustion gas and said fluidized catalyst particles into a combustion zone maintained at a temperature sufficient for oxidation of said combustible material and therein oxidizing said combustible material to produce hot fluidized catalyst particles;

(b) passing catalyst particles upward by fluidization from the combustion zone into a second zone located above the combustion zone, and collecting a dense phase bed of hot catalyst particles in a particle collection section located at the bottom of said second zone;

(c) transferring a stream of catalyst particles downward from said particle collection section through a particle flow control means and a vertically orientated first particle transfer conduit into an upper end of a backmixed particle cooling chamber;

(d) admixing said stream of catalyst particles into a backmixed dense phase particle bed located in a lower portion of the particle cooling chamber;

(e) fluidizing said dense phase fluidized particle bed located in the particle cooling chamber in a controlled manner by the upward passage of a controlled flow of a second stream of oxygen-containing combustion gas;

(f) cooling particles present in the backmixed dense phase fluidized particle bed located in the particle cooling chamber through the use of a heat exchanger entirely present in the lower portion of the particle cooling chamber;

(g) discharging the second stream of combustion gas and catalyst particles from the cooling chamber into the combustion zone through a second particle transfer conduit communicating with the cooling chamber at a point above the heat exchanger, and

(h) reducing or terminating the flow of the second stream of combustion gas and the admixture of said stream of particles into the dense phase particle bed located in the lower portion of the cooling chamber to thereby:

(i) reduce or terminate the fluidization of the particle bed located in the lower portion of the cooling chamber and catalyst cooling as desired for operation of the process and thereby substantially covering at least a portion of said heat exchanger with a stagnant bed of catalyst particles while:

(ii) still maintaining the downward flow of said stream of catalyst particles into the upper end of the cooling chamber and through said second particle transfer conduit into the combustion zone.

2. The process of claim 1 further characterized in that the second stream of combustion gas and catalyst particles is discharged substantially horizontally from the cooling chamber to the combustion zone.

3. The process of claim 2 further characterized in that the solid particles are catalyst employed in a fluidized catalytic cracking process.

4,578,367

METHODS FOR REPROCESSING COBALT CATALYSTS USED IN HYDROCARBOXYLATION

Peter Hofmann, Marl, Fed. Rep. of Germany, assignor to Chemische Werke Hüls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Division of Ser. No. 516,435, Jul. 25, 1983, Pat. No. 4,521,526, which is a continuation-in-part of Ser. No. 203,393, Nov. 3, 1980, abandoned. This application Feb. 19, 1985, Ser. No. 702,658
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1979, 2949878; Dec. 12, 1979, 2949939
Int. Cl.⁴ B01J *31/40*; C07C *67/38*; C11C *3/02*; C09F *5/08*
U.S. Cl. 502—24 **12 Claims**

1. A method for reprocessing cobalt catalyst from cobalt salts of carboxylic acids having 1 to 4 carbon atoms used in the reaction of olefins having 2 to 40 carbon atoms with carbon monoxide and an alkanol having 1 to 20 carbon atoms, comprising:

(a) reacting said olefins with said carbon monoxide and said alkanol in the presence of said cobalt catalyst to form a reaction output;

(b) oxidizing said reaction output with countercurrent oxygenated gas at a temperature from about 20° to 150° C. to form a pretreated reaction output;

(c) carrying out a stepwise distillation of said pretreated reaction output, separating an ester fraction and leaving a distillation sump product containing a cobalt residue having a cobalt content of about 2 to 30% by weight;

(d) treating said cobalt residue with water and a given carboxylic acid having 1 to 4 carbon atoms in a proportion from about 0.1 to 10 times the amount by weight of said given carboxylic acid at a temperature of about 20°–100° C. to form a first upper organic phase and a first lower aqueous acidic phase;

(e) separating said first upper organic phase from said first lower aqueous acidic phase;

(f) treating said separated first upper organic phase with said water and given carboxylic acid in a proportion from about 0.1 to 10 times the amount by weight of said given carboxylic acid at a temperature of about 20° to 100° C. to form a second upper organic phase and a second lower aqueous acidic phase;

(g) separating said second upper organic phase from said second lower aqueous acidic phase;

(h) recovering cobalt in the form of the carboxylic acid salt corresponding to said given carboxylic acid from said first and second separated lower aqueous acidic phases; and

(i) recirculating said carboxylic acid salt as said cobalt catalyst with a recovery of 98.4 to 99.97% of said cobalt catalyst.

2. The method of claim 1, wherein said temperature of step (b) is 70°–120° C.

4. The method of claim 2, wherein gamma-picoline is added as a promoter to said catalyst and said temperature of step (b) is 80° C. and step (b) is carried out for a period of 15 minutes and said water and carboxylic acid of steps (d) and (f) are equal proportions of acetic acid and water, said residue is 8.43% cobalt and the ratio of said residue to acetic acid is $\frac{1}{4}$.

4,578,368

CATALYST RECOVERY PROCESS

Joseph R. Zoeller, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 6, 1985, Ser. No. 730,604
Int. Cl.[4] B01J *38/62*
U.S. Cl. 502—28 **4 Claims**

1. Process for the recovery of noble metal from a noble metal containing tar formed in a process in which acetic anhydride is prepared by carbonylating methyl acetate in the presence of a noble metal catalyst, wherein said noble metal containing tar is mixed with about 1 part by weight tar to 1 to 10 parts of a lower fatty acid having 2 to 12 carbon atoms and heated at a temperature of at least 100° C. to precipitate said noble metal catalyst from said tar.

4,578,369

PROCESS FOR THE REGENERATION OF FLUORINATION CATALYSTS

Thomas Müller, Bad Homburg, and Günter Siegemund, Hofheim am Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 25, 1985, Ser. No. 748,546
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1984, 3423625
Int. Cl.[4] B01J *27/32, 27/12;* **C07C** *17/20*
U.S. Cl. 502—36 **5 Claims**

1. Process for the regeneration of spent chromium oxyfluoride fluorination catalysts wherein said process comprises mixing the catalyst with magnesium oxide or magnesium hydroxide in the presence of water, converting the mixture into a paste and drying the paste, whereby the dried paste is suitable for further activation with excess hydrofluoric acid.

3. Process as claimed in claim 1, wherein 0.001 to 100 kg magnesium oxide or 0.00145 to 145 kg magnesium hydroxide is used per kg of spent catalyst.

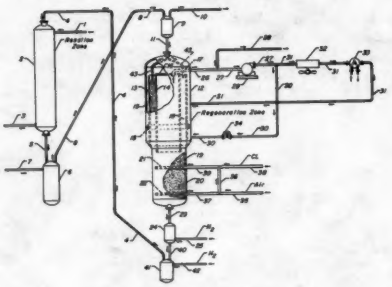
4. Process as claimed in claim 1, wherein the dried paste is treated with excess hydrofluoric acid at temperatures of 20°–500° C.

4,578,370

GAS CIRCULATION METHOD FOR MOVING BED CATALYST REGENERATION ZONES

Arthur R. Greenwood, Niles, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Apr. 25, 1985, Ser. No. 727,151
Int. Cl.[4] B01J *37/24, 38/26, 23/96;* **C10G** *35/085*
U.S. Cl. 502—37 **17 Claims**



1. A process for regenerating particulate catalyst which comprises the steps of:

(a) passing used catalyst into a regeneration zone and downward through the regeneration zone as a compact bed;

(b) contacting the used catalyst with an oxygen-containing gas stream in a combustion zone located within the regeneration zone at conditions which result in the combustion of carbon present on the used catalyst and thereby producing a combustion gas stream, which is withdrawn from the regeneration zone, and low-carbon catalyst;

(c) passing the low-carbon catalyst downward through a temperature adjustment zone located within the regeneration zone and therein contacting the low-carbon catalyst with a temperature adjusting gas stream;

(d) passing the low-carbon catalyst downward through a drying zone located within the regeneration zone and therein contacting the low carbon catalyst with a drying gas stream;

(e) compressing at least a major portion of the combustion gas stream, and thereby producing a first process gas stream;

(f) passing a first aliquot portion of the first process gas stream into the temperature adjustment zone as the previously referred to temperature adjusting gas stream; and,

(g) cooling a second aliquot portion of the first process gas stream and then passing the second aliquot portion of the first process stream into the combustion zone as the previously referred to oxygen-containing gas stream.

2. The process of claim 1 further characterized in that the drying gas stream comprises oxygen and is passed upward within the regeneration zone into the combustion zone thereby supplying oxygen consumed within the combustion zone.

7. A process for regenerating solid catalyst used in the reaction zone of a moving bed hydrocarbon conversion process which comprises the steps of:

(a) passing used catalyst which has been withdrawn from the reaction zone of a hydrocarbon conversion process into a unitary catalyst regeneration zone and downward through the regeneration zone as a compact bed;

(b) contacting the used catalyst with an oxygen-containing

gas stream in a combustion zone at conditions which result in the combustion of carbon present on the used catalyst and the production of a combustion gas stream, which is withdrawn from the regeneration zone, and low-carbon catalyst;

(c) passing the low-carbon catalyst downward into and through a heating zone located within the regeneration zone, and therein contacting the low carbon catalyst with a heating gas stream;

(d) passing the low-carbon downward into and through a chlorination zone located within the regeneration zone, and therein contacting the low carbon catalyst with a chlorination gas stream which comprises a chlorine-containing substance;

(e) withdrawing low carbon catalyst from the regeneration zone;

(f) pressurizing at least a major portion of the combustion gas stream and producing thereby a relatively high pressure first process gas stream;

(g) passing a first aliquot portion of the first process stream into the heating zone as the previously referred to heating gas stream; and,

(h) cooling a second aliquot portion of the first process stream by indirect heat exchange, and then passing the second portion of the first process stream into the combustion zone as the previously referred to oxygen-containing gas stream.

4,578,371
ALUMINOSILICATES HAVING A ZEOLITE STRUCTURE, AND PROCESS FOR THE MANUFACTURE THEREOF

Hans-Peter Rieck, and Hans-Jürgen Kalz, both of Hofheim am Taunus, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 551,268, Nov. 14, 1983, abandoned. This application Jul. 16, 1984, Ser. No. 630,941

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1982, 3242352; Jul. 15, 1983, 3325514

Int. Cl.[4] C01B *33/28;* **B01J** *29/06, 27/14*

U.S. Cl. 502—71 **2 Claims**

1. Process for the manufacture of a crystalline, phosphorus-containing zeolite having a ZSM–5 type crystal lattice structure by mixing water, a silicon dioxide source, an alkali metal hydroxide and an aluminum compound, and reacting this mixture at a temperature of from 95 to 230° C until the zeolite has crystallized, which comprises adding solid $AlPO_4$ to the mixture of reactants and carrying out the reaction without addition of an organic compound, the reaction mixture having a composition expressed in terms of mole ratio of oxides of SiO_2:Al_2O_3 from 15 to 200 P_2O_5:SiO_2 from 10^{-3} to 0.2 and P_2O_5:Al_2O_3 from 0.1 to 200.

4,578,372
PREPARATION OF ZEOLITE COATED SUBSTRATES

Klaas Hoving, Heenvliet, and Johannes W. M. Walterbos, Heilevoetsluis, both of Netherlands, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Dec. 19, 1984, Ser. No. 683,366

Claims priority, application United Kingdom, Dec. 30, 1983, 8334626

Int. Cl.[4] B01J *29/06, 37/00;* **B22F** *5/00*

U.S. Cl. 502—74 **15 Claims**

1. A process for the preparation of a zeolite layer upon a substrate which does not have the same crystalline structure as the zeolite, in which process the substrate is contacted with a reaction mixture for forming a zeolite and the reaction mixture is heated to bring about zeolite formation, in which the substrate is tumbled within the reaction mixture during heating so as to cause zeolite formation preferentially as a layer on the surface of the substrate.

4. A process for the preparation of magnetizable particles comprising zeolite Y for use in a magnetically stabilized bed, in which process magnetizable particles are introduced into a rotatable vessel containing a reaction mixture for forming zeolite Y, the reaction mixture is heated to form zeolite Y, and during the heating the vessel is rotated about an inclined axis so that zeolite Y is formed as a layer on the surface of the magnetizable particles.

8. A process as claimed in claim 4, in which the magnetizable particles are particles of iron, cobalt, steel or magnetite.

4,578,373
POLYMERIZATION CATALYST SYSTEM

Victoria Graves, Crosby, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Sep. 4, 1984, Ser. No. 647,323

Int. Cl.[4] C08F *4/64*

U.S. Cl. 502—113 **23 Claims**

1. A catalyst system for polymerizing at least one alpha-olefin under conditions characteristic of Ziegler polymerization comprising:

I. a supported polymerization catalyst or mixture of polymerization catalysts prepared under anhydrous conditions by the sequential steps of:

(a) preparing a slurry of inert particulate porous support material;

(b) adding to said slurry a solution of an organomagnesium compound;

(c) adding to said slurry and reacting a solution of a zirconium halide compound, hafnium compound or mixtures thereof;

(d) adding to said slurry and reacting a halogenator;

(e) adding to said slurry and reacting a tetravalent titanium halide compound; and

(f) recovering solid catalyst component;

II. an organoaluminum compound; and

III. a promoter of chlorinated hydrocarbons having one to 20 carbon atoms.

4,578,374
POLYMERIZATION CATALYST, PRODUCTION AND USE

Steven A. Best, Houston, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Dec. 12, 1984, Ser. No. 680,880

Int. Cl.[4] C08F *4/68*

U.S. Cl. 502—115 **26 Claims**

1. A vanadium-containing catalyst component obtained by sequentially treating an inert solid support material in an inert solvent with

(A) a dihydrocarbyl magnesium compound,

(B) optionally an oxygen-containing compound which is an alcohol, ketone and aldehyde,

(C) a vanadium compound, and

(D) a Group IIIa metal halide.

4,578,375
LANTHANUM HYDROXIDE AND A RHODIUM OR RUTHENIUM MOIETY CATALYST FOR HOMOLOGATION OF ALCOHOLS

Donald M. Fenton, Anaheim, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 643,835, Aug. 24, 1984, Pat. No. 4,540,836. This application May 31, 1985, Ser. No. 740,235

Int. Cl.[4] B01J *27/10, 23/46;* **C07C** *29/00, 31/08*

U.S. Cl. 502—230 **8 Claims**

1. A catalyst for the homologation of alcohols consisting essentially of a rhodium moiety supported on lanthanum hydroxide wherein the atomic ratio of lanthanum to rhodium is in the range between about 0.001 and 50 to 1.

2. The catalyst of claim 1 wherein said rhodium moiety is $RhCl_3$.

4,578,376
PHARMACEUTICAL COMPOSITIONS FOR THE TREATMENT OF OSTEOPATHIAS

Sergio Rosini, Leghorn, Italy, assignor to Istituto Gentili S.p.A., Pisa, Italy

Continuation of Ser. No. 527,373, Aug. 26, 1983, abandoned, which is a continuation of Ser. No. 342,780, Jan. 26, 1982, abandoned. This application Dec. 3, 1984, Ser. No. 677,177
Claims priority, application Italy, Feb. 12, 1981, 19673 A/81
Int. Cl.[4] A61K *31/66*
U.S. Cl. 514—108 **8 Claims**

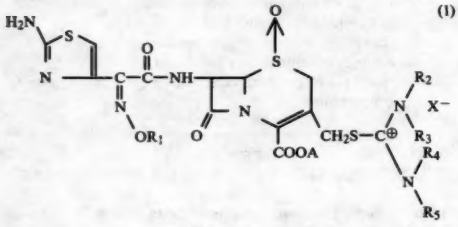
1. The method of treatment of a patient affected by metastatic osteolysis or Paget's disease, which consists of administering to said patient a composition containing as the active ingredient 6-amino-1-hydroxyhexane-1, 1-diphosphonic acid or a pharmaceutically acceptable salt thereof, in an amount between 10 mg and 40 mg daily.

4,578,377
DERIVATIVES OF CEPHALOSPORINS, THEIR PROCESS OF SEPARATION AND ANTIBIOTIC DRUGS CONTAINING THE SAID DERIVATIVES

Bernard Labeeuw, Montpelier, and Ali Salhi, Saint-Gely-Du-Fesc, both of France, assignors to Sanofi, Paris, France

Continuation of Ser. No. 513,008, Jul. 12, 1983, abandoned. This application Apr. 16, 1985, Ser. No. 723,709
Claims priority, application France, Jul. 13, 1982, 82 12317
Int. Cl.[4] A61K *31/545*; C07D *501/34*
U.S. Cl. 514—206 **8 Claims**

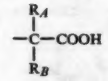
1. Cephalosporin compounds having the formula:



(I)

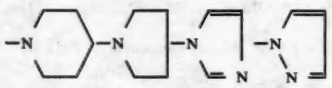
in the form of syn or anti isomers or a mixture of these isomers, and in which the acidic group —COOA is selected from the class consisting of pharmaceutically acceptable acids, salts, and easily hydrolysable esters;

R_1 represents a group:



in which R_A and R_B each independently designates hydrogen or a lower alkyl group, or R_A and R_B, taken together with the carbon atom to which they are bonded, form a cycloalkyl;

R_2 and R_3 each independently designates hydrogen, a lower alkyl group, a lower alkenyl group; or R_4 and R_5, taken together with the nitrogen atom to which they are bonded, form a ring selected from the class consisting of



and X designates the anion of an acid.

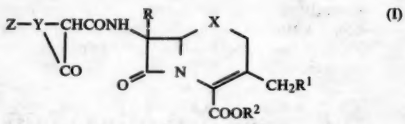
4. A pharmaceutical composition for the treatment of bacterial infections comprising a therapeutically effective amount of a compound having the formula (1) of claim 1, in association with a pharmaceutically acceptable carrier.

4,578,378
(OXOHETEROCYCLIC CARBONAMIDO)CEPHEM CARBOXYLIC ACID DERIVATIVES

Yoshio Hamashima, Kyoto; Koji Ishikura, Nara; Tadatoshi Kubota, Osaka, and Kyoji Minami, Nara, all of Japan, assignors to Shionogi & Co., Ltd., Dosho, Japan

Filed Jun. 27, 1984, Ser. No. 625,308
Claims priority, application Japan, Jul. 6, 1983, 58-123698
Int. Cl.[4] A61K *31/535*; C07D *498/04*
U.S. Cl. 514—210 **14 Claims**

1. 7β-(Oxo saturated heterocyclic carbonamino)-3-cephem-4-carboxylic acid compound of the following formula:



(I)

wherein R is hydrogen or methoxy;

R^1 is hydrogen or a nucleophilic group having 1 to 8 carbon atoms excluding any protective group and is 4 to 6C heterocyclicammonio or its anion, 1 to 3C alkanoyloxy, carbamoyloxy optionally N-protected, halo, 4 to 8 C heterocyclic thio or heterocyclic sulfoxido;

R^2 is hydrogen, light metal, or a carboxy protecting group;

X is oxygen;

Y is alkylene containing one or more hetero atom; and

Z is hydrogen or a substituent having up to 8 carbon atoms and being selected from the group consisting alkyl, aralkyl, alkylidene, aryl, alkanoyl, carbamoyl, hydroxy, alkoxy, oxo and sulfoxide, which may be unsubstituted or further substituted by carboxy, carbamoyl, cyano, hydroxy which is protected or unprotected, or halogen.

14. The pharmaceutical composition containing a 7β-(oxo saturated heterocyclic carboxamido)-3-cephem-4-carboxylic acid derivative as claimed in claim 1 as an active ingredient and a conventional carrier.

4,578,379
USE OF PHENOTHIAZINE 5-OXIDE DRUGS AS VAGINAL CONTRACEPTIVES

Milton J. Cormier, Bogart, Ga., assignor to University of Georgia Research Foundation, Inc., Athens, Ga.

Continuation-in-part of Ser. No. 546,379, Oct. 28, 1983, abandoned, Division of Ser. No. 398,848, Jul. 14, 1982, Pat. No. 4,444,789, which is a continuation-in-part of Ser. No. 155,800, May 30, 1980, Pat. No. 4,443,446. This application Nov. 30, 1984, Ser. No. 676,589
Int. Cl.[4] A61K *31/54*
U.S. Cl. 514—223 **10 Claims**

1. A method of preventing conception in a female which comprises introducing an effective amount of a calmodulin binding phenothiazine 5-oxide drug into the vagina of the female.

4,578,380
5H-[1]BENZOPYRANO[2,3-D]PYRIMIDINE DERIVATIVES USEFUL FOR CONTROLLING LESIONS OF THE GASTRIC AND DUODENAL MUCOUS MEMBRANES

Gerhard Satzinger, Denzlingen; Hubert Barth, Emmendingen; Johannes Hartenstein, Stegen-Wittental; Manfred Herrmann; Edgar Fritschi, both of St. Peter, and Ilse-Dore Schütt, Glottertal, all of Fed. Rep. of Germany, assignors to Warner-Lambert Company, Morris Plains, N.J.

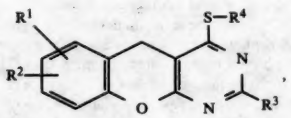
Filed Sep. 24, 1984, Ser. No. 653,175

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1983, 3335472

Int. Cl.[4] A61K *31/505;* **C07D** *491/052, 491/153*

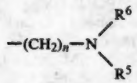
U.S. Cl. 514—232 **6 Claims**

1. A 5H-[1]benzopyrano-[2,3-d]pyrimidine derivative of the formula I,



(I)

wherein R^1 and R^2, which may be the same or different, represent a hydrogen or halogen atom, a hydroxyl group or a straight-chain or branched alkoxy group with up to four carbon atoms, or together form an alkylenoxy- or alkylenedioxy group with one to three carbons atoms or, together an unsubstituted benzene ring condensed in 6,7-position, R^3 represents an optionally substituted phenyl radical, R^4 an alkyl group containing one to eight atoms or the radical,



wherein R^5 and R^6, which may be the same or different, represent a hydrogen atom, a straight-chain or branched alkyl group with up to six carbon atoms or together with the nitrogen atom to which they are attached form a pyrrolidino-, piperidino-, morpholino, or piperazino group and n represents the integers two to six, or a pharmacologically acceptable salt with an organic or inorganic acid.

5. A pharmaceutical composition for controlling lesions of the gastric and duodenal mucous membranes comprising an effective amount of a compound according to claim **1**, together with pharmaceutically acceptable fillers and excipients.

6. A method of controlling lesions of the gastric and duodenal mucous membranes in a subject suffering from ulcers comprising administering to said subject an effective amount of a pharmaceutical composition according to claim **5**.

4,578,381
CARBOSTYRIL DERIVATIVES

Minoru Uchida, Komatsujima; Makoto Komastu, and Kazuyuki Nakagawa, both of Tokushima, all of Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Japan

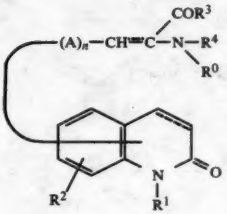
Filed Jul. 1, 1983, Ser. No. 510,241

Claims priority, application Japan, Jul. 5, 1982, 57-117311; Jul. 5, 1982, 57-117312

Int. Cl.[4] A61K *31/47;* **C07D** *215/22*

U.S. Cl. 514—233 **47 Claims**

1. (a) A carbostyril derivative or salt thereof represented by the formula



wherein:

R^1 is a hydrogen atom, a lower alkyl group, a lower alkenyl group, a lower alkynyl group or a phenyl-lower alkyl group;

R^2 is a hydrogen atom, a halogen atom, a benxoyloxy group, said benzoyloxy group having a halogen atom substituent, a hydroxyl group, a lower alkyl group or a lower alkoxy group;

R^3 is a hydroxyl group, an amino group, said amino group having a cycloalkyl-lower alkyl group substituent, said amino group having a cycloalkyl-lower alkyl group substituent having a carboxy group or a lower alkoxycarbonyl group substituent on the cycloalkyl ring, a lower alkoxy group, a lower alkoxycarbonyl-lower alkoxy group, a benzoyl-lower alkoxy group or a lower alkanoyloxy-lower alkoxy group;

R^4 is a hydrogen atom, a phenylsulfonyl group, said phenylsulfonyl group having lower alkyl group or halogen atom substituents, a lower alkyl group, a phenyl-lower alkyl group, said phenyl-lower alkyl group having halogen atom substituents on the phenyl ring, or a group of the formula $—COR^5$ wherein R^5 is a lower alkyl group, said lower alkyl group having amino group or phenyl-lower alkoxycarbonylamino group substituents, a cycloalkyl group, said cycloalkyl group having an amino-lower alkyl group or a phenyl-lower alkoxycarbonylamino-lower alkyl group substituent on the cycloalkyl ring, a phenyl group, said phenyl group having 1 to 3 halogen atom, lower alkyl group, lower alkoxy group, nitro group, amino group or hydroxyl group substituents on the phenyl ring, or a 5- or 6-membered unsaturated heterocyclic ring selected from the group consisting of pyridyl, 2-methylpyridyl, 3-ethylpyridyl, 4-butylpyridyl, thienyl, 2-methylthienyl, 3-propylthienyl, pyrimidyl, 2-pentylpyrimidinyl, pyrrolyl, 3-methyl-pyrrolyl, 1-pyrazinyl, 4-pentyl-1-pyraxinyl, pyrazoylyl, 3-methylpyrazolyl, 4-ethylpyrazolyl, imidazolyl, 2-propylimidazolyl, 4-pentylimidazolyl, pyridazinyl, 4-methylpyridazinyl, pyrazinyl, 2-ethylpyrazinyl, oxazolyl, 4-butyloxazolyl, isoxazolyl, 4H-1,4-oxazinyl, thiazolyl, 4-methylthiazolyl, 2-ethylthiazolyl, 5-propylthiazolyl, isothiazolyl, 3-methylisothiazolyl, furyl, 3-methylfuryl, 2-ethylfuryl, 2-methylthianyl, 4-methylthianyl and 4-methylthianyl groups;

R^0 is a hydrogen atom, a phenylsulfonyl group or said phenylsulfonyl group having lower alkyl group or halogen atom substituents;

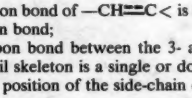
A is a lower alkylene group;

n is 0 or 1;

the carbon-carbon bond of $—CH{=}C<$ is a single or double carbon-carbon bond;

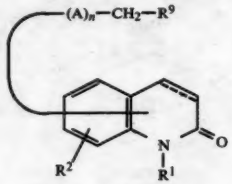
the carbon-carbon bond between the 3- and 4-positions in the carbostyril skeleton is a single or double bond; and

the substitution position of the side-chain of the formula



is any one of the 3-, 4-, 5-, 6-, 7- or 8-positions in the carbostyril skeleton;

(b) a carbostyril derivative represented by the formula

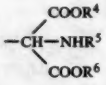


wherein:

R^1 is a hydrogen atom, a lower alkyl group, a lower alkenyl group, a lower alkynyl group or phenyl-lower alkyl group;

R^2 is a hydrogen atom, a hydroxyl group, a lower alkyl group, a lower alkoxy group, a halogen atom, a benzoyloxy group or said benzoyloxy group having halogen atom substituents;

R^9 is a group of the formula



wherein R^4 and R^6 are lower alkyl groups and R^5 is a lower alkanoyl group;

A is a lower alkylene group;

n is 0 or 1;

the carbon-carbon bond between the 3- and 4- positions in the carbostyril skeleton is a single or double bond; and

the substitution position of the side-chain of the formula $-(A)_n-CH_2-R^9$ is any one of the 3-, 4-, 5-, 6-, 7-, or 8-positions in the carbostyril skeleton;

provided that when R^2 is a hydrogen atom and n is 1, and R^9 is a halogen atom, then the substitution position of the side chain of the formula $-(A)_n-CH_2-R^9$ is the 3- or 4-position in the carbostyril skeleton.

43. A pharmaceutical composition for use in an anti-peptic ulcer agent, which contains the carbostyril derivative as claimed in claim 1(a) as the active ingredient.

4,578,382

4-ACYLAMINO-1-AZAADAMANTANES, AND COMPOSITIONS FOR USE THEREOF IN MEDICINE

Francois X. Jarreau, Versailles, and Jean-Jacques Koenig, Vernou la Celle sur Seine, both of France, assignors to Etablissements Nativelle S.A., France

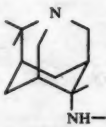
Filed Sep. 29, 1982, Ser. No. 427,343

Claims priority, application France, Oct. 5, 1981, 81 18682

Int. Cl.[4] A61K *31/435;* **C07D** *471/18*

U.S. Cl. 514—245 **10 Claims**

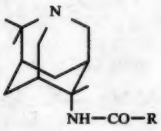
1. A 4-acylamino-1-azaadamantane represented by the general formula (I):



(I)

wherein R is an usubstituted aryl group selected from the group consisting of phenyl, benzyl, phenethyl, phenylpropyl, diphenylethyl and diphenylpropyl or said aryl group is substituted by one or two of a halogen atom, an alkyl of 1 to 4 carbon atoms, hydroxy, methylenedioxy, alkoxy of 1 to 3 carbon atoms, amino, alkylamino having 1 to 3 carbon atoms in the alkyl moiety, dialkylamino having 1 to 3 carbon atoms in the alkyl moiety, nitro, cyano, acetylamino, alkanoyl of 1 to 4 carbon atoms, trifluoromethyl or trichloromethyl group, or a pharmaceutically acceptable acid salt thereof.

7. A 4-acylamino-1-azaadamantane represented by general formula (I):



(I)

wherein R is an unsubstituted aryl group selected from the group consisting of phenyl, benzyl, phenethyl, phenylpropyl, diphenylethyl and diphenylpropyl or said aryl group substituted by one or two of a halogen atom or an alkyl of 1 to 4 carbon atoms, hydroxy, methylenedioxy, alkoxy of 1 to 3 carbon atoms, amino, nitro, cyano, acetylamino or lower alkanoyl of 1 to 4 carbon atoms or a pharmaceutically acceptable acid salt thereof.

8. A pharmaceutical composition for treating cardiac arrhythmias comprising a therapeutically effective amount of a 4-acylamino-1-azaadamantane or a pharmaceutically acceptable acid salt thereof of claim 1, as an active ingredient, and a pharmaceutically acceptable carrier or diluent.

4,578,383

CL 1565 ANTIBIOTIC COMPOUNDS

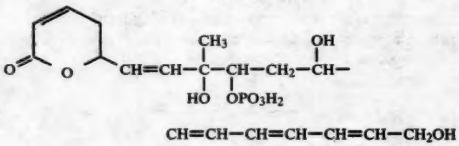
Suresh S. Stampwala, Sterling Heights; James C. French, Ann Arbor; Josefino B. Tunac, Troy; Timothy R. Hurley, and Richard H. Bunge, both of Ann Arbor, all of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

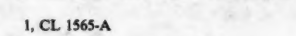
Continuation-in-part of Ser. No. 447,544, Dec. 7, 1982, abandoned, which is a continuation-in-part of Ser. No. 439,973, Nov. 8, 1982, abandoned, which is a continuation-in-part of Ser. No. 351,704, Feb. 24, 1982, abandoned. This application Jul. 2, 1984, Ser. No. 627,367

Int. Cl.[4] C07D *9/09;* **A61K** *31/665, 31/685*

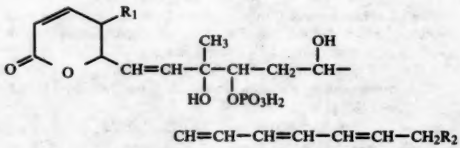
U.S. Cl. 514—7 **10 Claims**

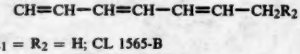
1. A phosphorus containing antibiotic compound selected from pharmaceutically acceptable salts of the compounds designated CL 1565-A, CL 1565-B, and CL 1565-T, having the structural formulas 1, 2a, and 2b, respectively,





1, CL 1565-A





2a, $R_1 = R_2 = H$; CL 1565-B
2b, $R_1 = R_2 = OH$; CL 1565-T

4,578,384

POLYLACTIC-POLYGLYCOLIC ACIDS COMBINED WITH AN ACIDIC PHOSPHOLIPID-LYSOZYME COMPLEX FOR HEALING OSSEOUS TISSUE

Jeffrey O. Hollinger, Glenwood, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 15, 1984, Ser. No. 580,496
Int. Cl.[4] C07C 37/02
U.S. Cl. 514—8 4 Claims

1. A method for improving and promoting the healing of osseous tissue in an animal which comprises implanting at the site of the broken osseous tissue an effective amount of a biodegradable copolymer-proteolipid material, said material consisting essentially of from 1 to 5 weight percent of the mucopeptide-N-acetylmuramoylhydrolase:phosphatidyl inositol 4,5-diphosphate, incorporated into from 95 to 99 weight percent of the biodegradable copolymer, 50:50 poly(L)(-)lactide coglycolide.

4,578,385

USE OF PHENOTHIAZINE 5-OXIDE DRUGS IN UTERUS TO PREVENT PREGNANCY

Milton J. Cormier, Bogart, Ga., assignor to University of Georgia Research Foundation, Inc., Athens, Ga.

Continuation-in-part of Ser. No. 398,847, Jul. 14, 1982, abandoned, which is a continuation-in-part of Ser. No. 253,567, Jul. 6, 1981, Pat. No. 4,377,577, which is a continuation-in-part of Ser. No. 155,800, May 30, 1980, Pat. No. 4,443,446. This application Nov. 13, 1984, Ser. No. 670,539
Int. Cl.[4] A61K 31/54
U.S. Cl. 514—223 15 Claims

1. A method of preventing pregnancy in a female which comprises introducing an effective amount of a calmodulin binding phenothiazine 5-oxide drug directly into the uterus of the female after sexual intercourse.

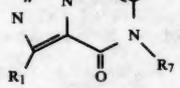
4,578,386

7,8-DIHYDROIMIDAZO[1,5-A]PYRAZIN-8-ONES

Thomas D. Lee, Scarsdale, N.Y., assignor to USV Pharmaceutical Corp., Tarrytown, N.Y.

Filed Feb. 10, 1984, Ser. No. 578,916
Int. Cl.[4] C07D 487/04, 519/00; A61K 31/50, 31/53
U.S. Cl. 514—241 19 Claims

1. Compounds of the formula



wherein

R_1, R_3, R_5 and R_6 are independently H; C_1–C_8 alkyl; ar C_1–C_8 alkyl; an aryl substituent which is phenyl or phenyl mono substituted with C_1–C_8 alkyl, halo, amino, trifluoromethyl or cyano; a heteroaryl substituent which is imidazole, pyrazole, pyrrole, triazine, pyridazine, pyrimidine, pyridine, pyrazine, purine, benzimidazole, indole, phthalazine, quinoline or the heteroaryl mono substituted with C_1–C_8 alkyl, halo, amino, trifluoromethyl or cyano; C_2–C_8 alkenyl; C_2–C_8 alkynyl; hydroxy, hydroxy-C_1–C_8 alkyl, C_1–C_8 alkoxy, mercapto, mercapto C_1–C_8 alkyl, C_1–C_8 alkythio, amino, C_1–C_8 alkylamino, amino C_1–C_8 alkyl, formyl, carboxy and salts thereof, C_1–C_8 carb alkoxy, C_1–C_8 alkanoyl, cyano, nitro, halo, trifluoromethyl, C_1–C_8 alkylsulfonyl, aminosulfonyl, carbamoyl or C_3–C_8 cycloalkyl;

R_7 is H, C_1–C_8 alkyl, an aryl substituent which is phenyl or phenyl mono substituted with alkoxy, amino or halo, ar C_1–C_8 alkyl, or C_1–C_8 alkanoyl;

wherein at least one of R_1, R_5 and R_6 is an aryl or heteroaryl, and

pharmaceutically acceptable acid addition salts thereof.

3. A method of treating congestive heart failure in a patient requiring such treatment, wherein the method comprises the administration of a composition containing effective amount of a compound of claim 1.

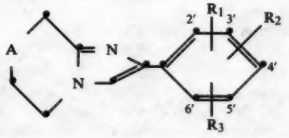
4,578,387

INOTROPIC AGENTS

Wayne A. Spitzer, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Mar. 5, 1984, Ser. No. 586,361
Int. Cl.[4] C07D 471/04, 487/04; A61K 31/495, 31/445
U.S. Cl. 514—249 13 Claims

1. Compounds of the formula



and their pharmaceutically acceptable acid addition salts, wherein:

A is NH;

each of R_1 and R_2 is independently hydrogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, allyloxy, propargyloxy, benzyloxy, (C_1–C_4 alkyl)thio, (C_1–C_4 alkyl)sulfinyl, (C_1–C_4 alkyl)sulfonyl, hydroxy, halo, cyano, nitro, amino, mono- or di-(C_1–C_4 alkyl)amino, trifluoromethyl, or Z-Q-substituted C_1–C_4 alkoxy, wherein Q is oxygen, sulfur, sulfinyl, sulfonyl, or a bond, and Z is C_1–C_4 alkyl, phenyl or phenyl substituted with halo, C_1–C_4 alkyl, C_1–C_4 alkoxy, hydroxy, nitro, amino, (C_1–C_4 alkyl)thio, (C_1–C_4 alkyl)sulfinyl, or (C_1–C_4 alkyl)sulfonyl;

and R_3 is hydrogen, C_1–C_4 alkoxy, C_1–C_4 alkyl, or halo;

with the proviso that R_1, R_2, and R_3 may not all be hydrogen at the same time.

9. A method of producing a positive inotropic effect or causing vasodilation in a mammal, which comprises administering to such mammal an effective amount of a compound of claim 1.

4,578,388

UNSYMMETRICAL GUANIDINO, THIOUREIDO, ISOTHIOUREIDO AND NITROMETHYLENEAMINO DERIVATIVES

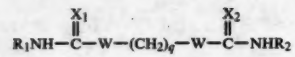
Graham J. Durant, and Charon R. Ganellin, both of Welwyn Garden City, England, assignors to SmithKline & French Laboratories Limited, Welwyn Garden City, England

Division of Ser. No. 272,811, Jun. 11, 1981, Pat. No. 4,405,621, which is a division of Ser. No. 70,950, Aug. 30, 1949, Pat. No. 4,301,165, which is a division of Ser. No. 941,836, Sep. 11, 1978, Pat. No. 4,197,305, which is a division of Ser. No. 836,626, Sep. 26, 1977, Pat. No. 4,137,319, which is a division of Ser. No. 678,564, Apr. 20, 1976, Pat. No. 4,070,472, which is a division of Ser. No. 542,971, Jan. 22, 1975, Pat. No. 3,968,227, and Ser. No. 542,971, Jan. 22, 1975, now Re. Re. 29,761. This application Jun. 30, 1983, Ser. No. 509,563

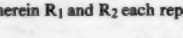
Claims priority, application United Kingdom, Feb. 7, 1974, 5596/74

Int. Cl.[4] A61K 31/38, 31/41, 31/415, 31/42, 31/425, 31/495, 31/50; C07D 403/12, 413/12, 417/12
U.S. Cl. 514—252 12 Claims

1. A compound of the formula:



wherein R_1 and R_2 each represent a grouping of the structure:



wherein Het is a nitrogen containing 5 or 6 membered heterocyclic ring selected from imidazole, thiazole, isothiazole, oxazole, isoxazole, pyrazole, triazole, thiadiazole, pyrimidine, pyrazine or pyridazine which is optionally substituted by lower alkyl, hydroxyl, halogen or amino, except that R_1 and R_2 are not both selected from thiazole, isothiazole, oxazole, isoxazole, pyrazole or triazole containing groups, and are not both thiadiazole or pyrimidine or pyrazine or pyridazine, and when one of R_1 and R_2 is an imidazole containing group, the other is not an imidazole, pyrazole or triazole containing group; Z is sulphur or a methylene group; m is 0, 1 or 2; n is 2 or 3 and the sum of m and n is 3, 4 or when Y is other than hydrogen, methyl, or hydroxyl, 2; X_1 and X_2, which may be the same or different, are each sulphur, $CHNO_2$ or NY wherein Y is hydrogen, hydroxy, lower alkyl, cyano, $CONH_2$ or SO_2R_3; R_3 is lower alkyl, phenyl, tolyl, trifluoromethyl or amino; W is NH, and when X_1 and X_2 are NH, W may also be sulphur, and q is an integer from 2 to 8; or a pharmaceutically acceptable acid addition salt thereof.

12. A method of inhibiting H-2 histamine receptors, said H-2 histamine receptors being those histamine receptors which are not inhibited by mepyramine but are inhibited by burimamide, which comprises administering orally or parenterally to an animal in need thereof in an effective amount to inhibit said receptors a compound of claim 1.

4,578,389

QUINAZOLINE AND MEDICAMENTS CONTAINING THESE COMPOUNDS

Helmut Schickaneder, Eckental; Istvan Szeleny, Schwaig; Peter Mörsdorf, Cadolzburg, and Kurt H. Ahrens, Nuremberg, all of Fed. Rep. of Germany, assignors to Ludwig Heumann & Co. GmbH, Nuremberg, Fed. Rep. of Germany

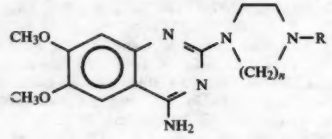
Filed Sep. 10, 1984, Ser. No. 649,099

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1983, 33364095

Int. Cl.[4] A61K *31/505;* **C07D** *403/14*

U.S. Cl. 514—254 **6 Claims**

1. Quinazoline derivatives corresponding to the following formula



(I)

in which:

R represents a triazole ring which is substituted in the 1-position by a methyl group and in the 3-position or the 5-position by an amino group, the triazole ring being attached to the piperazine or homopiperazine ring through a carbon atom, and n has a value of 2 or 3,

and physiologically compatible salts thereof.

4. A medicament containing an antihypertensive effective amount of a compound as claimed in claim 1 together with an inert pharmaceutically compatible carrier or an inert pharmaceutically compatible diluent.

4,578,390

HYDROXYBENZYLAMINO DERIVATIVES AS ANTI-INFLAMMATORY AGENTS

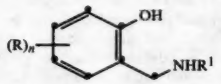
Norman P. Jensen, New Providence, and Michael N. Chang, Westfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 330,542, Dec. 14, 1981. This application Apr. 13, 1983, Ser. No. 484,406

Int. Cl.[4] C07D *353/36, 285/10;* **A61K** *31/38, 31/41*

U.S. Cl. 514—255 **10 Claims**

1. A compound of formula (I)



(I)

or a pharmaceutically acceptable salt thereof wherein R is

(a) hydrogen;
(b) halo;
(c) C_{1-6}alkoxy;
(d) C_{1-6}alkylthio or C_{1-6}haloalkylthio;
(e) C_{1-6}alkyl sulfinyl;
(f) C_{1-6}alkyl sulfonyl;
(g) phenyl C_{1-6}alkoxy;
(h) C_{1-6}alkyl;
(i) C_{1-6}alkenyl;
(j) C_{1-6}alkanoyl;
(k) —OCH_2O—;
(l) —COOH;
(m) phenyl;
(n) phenoxy;
(o) cyano;
(p) hydroxy C_{1-6}alkyl; or
(q) C_{1-6}alkanoyloxy;

R^1 is heteroaryl selected from a group consisting of

(1) thienyl
(2) benzothienyl
(3) pyrryl;
(4) thiadiazolyl;
(5) benzothiadiazolyl;
(6) benzimidazolyl;

the heteroaryl groups above can be unsubstituted or substituted with one or more of R^3 when R^3 represents H, CH_3, F, Cl, $COCH_3$, —CN —$COOR^4$ where R^4 represents C_{1-6}alkyl; n is 1 to 4.

4,578,391

OILY COMPOSITIONS OF ANTITUMOR DRUGS

Hiroitsu Kawata, Saitama; Tadayoshi Ohmura, Niiza; Shunji Hasumi, Saitama; Yutaka Konno, Saitama; Masayoshi Aruga, Saitama; Seiki Tashiro, Kumamoto; Toshimitsu Konno, Kumamoto, and Ken Iwai, Kumamoto, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Jan. 13, 1983, Ser. No. 457,636

Claims priority, application Japan, Jan. 20, 1982, 57-7997; Aug. 12, 1982, 57-215049

Int. Cl.[4] A61K *31/505, 31/40*

U.S. Cl. 514—256 **15 Claims**

1. An oily composition of an effective amount of an antitumor drug comprising a sparingly oil-soluble or water-soluble antitumor drug selected from the group consisting of carmofur, 5-fluorouracil, mitomycin C, aclarubicin hydrochloride, ancitabine, and ancitabine hydrochloride, an effective amount of a fat or oil, and an effective amount of a solubilizing adjuvant selected from the group consisting of crown ethers, lecithin, polyethylene glycol, propylene glycol, vitamin E, polyoxyethylene alkylether, and sucrose esters of fatty acids, the proportion of said solubilizing adjuvant being within the range of 0.05 to 1000 parts by weight per part by weight of said antitumor drug.

4,578,392

PYRAZOLO[1,5-A]PYRIDINE DERIVATIVES AND ANTI-ALLERGIC COMPOSITIONS CONTAINING THEM

Tsutomu Irikura, Tokyo; Keigo Nishino, Oomiya; Seigo Suzue, Kuki, and Toshiya Ikeda, Oomiya, all of Japan, assignors to Kyorin Pharmaceutical Co., Ltd., Tokyo, Japan

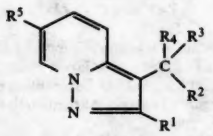
Filed Mar. 7, 1984, Ser. No. 586,928

Claims priority, application Japan, Mar. 14, 1983, 58-41958

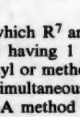
Int. Cl.[4] A61K *31/44;* C07D *471/04*

U.S. Cl. 514—300 3 Claims

1. A pyrazolo[1,5-a]pyridine derivative of the formula [I],



in which R^1 is a straight or branched alkyl radical having 1 to6 carbon atoms, R^2 is a hydrogen or straight, branched or cyclic alkyl radical having 1 to 6 carbon atoms, R^3 is a hydrogen, straight or branched alkyl having 1 to 6 carbon atoms, or allyl radical R^4 is hydrogen, —OR^6 (in which R^6 is a hydrogen, alkyl having 1 to 5 carbon atoms, which alkyl may optionally be substituted by one or two hydroxy radicals, allyl or 2,3-epoxypropyl radical) or, together with R^2 or R^3 forms



(in which R^7 and R^8 are each independently a hydrogen or alkyl having 1 to 5 carbon atoms), and R^5 is a hydrogen, methyl or methoxy radical, provided that R^2, R^3, and R^4 are not simultaneously hydrogen.

3. A method of treatment for allergic diseases comprising administering an anti-allergic effective amount of at least one compound according to claim 1 to a patient requiring such treatment.

4,578,393

DIHYDROISOQUINOLINE DERIVATIVES

Roger E. Markwell, Great Dunmow, and Stephen A. Smith, Bishops Stortford, both of England, assignors to Beecham Group p.l.c., Middlesex, England

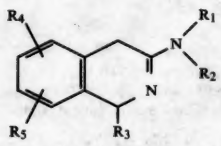
Filed Oct. 22, 1984, Ser. No. 663,232

Claims priority, application United Kingdom, Oct. 20, 1983, 8328052

Int. Cl.[4] A61K *31/47;* C07D *217/24, 217/22*

U.S. Cl. 514—310 12 Claims

1. A compound of formula (I) or a pharmaceutically acceptable salt or solvate thereof:



(I)

wherein:

R_1 and R_2 are independently hydrogen, C_{1-6} alkyl or together are a group X which is C_{3-6} polymethylene in which one carbon atom in optionally replaced by an oxygen or sulphur atom or by NR_6 is hydrogen or C_{1-6} alkyl;

R_3 is phenyl, optionally substituted by one or more substituents selected from halogen, CF_3, nitro, C_{1-6} alkoxy, C_{1-6} alkylthio, C_{2-7} alkanoyl, carboxyl, C_{1-6} alkoxycarbonyl, cyano, $CONR_7R_8$ wherein R_7 and R_8 are selected from hydrogen or C_{1-6} alkyl or together are a group X; NR_9R_{10} wherein R_9 and R_{10} are selected from hydrogen, C_{1-6} alkyl, C_{2-7} alkanoyl or C_{1-6} alkylsulphonyl or together are a group X; $SO_2NR_{11}R_{12}$ wherein R_{11} and R_{12} are selected from hydrogen or C_{1-6} alkyl or together are a group X, or $S(O)_mR_{13}$ wherein m is 1 or 2 and R_{13} is C_{1-6} alkyl;

R_4 and R_5 are independently selected from hydrogen, C_{1-6} alkyl, cyano, amino, aminocarbonyl or aminocarbamoyl optional substituted by one or two C_{1-6} alkyl groups or together a group X, halogen, CF_3, nitro, C_{1-6} alkoxy, C_{1-6} alkylthio, C_{2-7} alkanoyloxy, C_{1-6} alkoxy or hydroxy, or together are methylenedioxy or C_{3-5} polymethylene.

12. A method of treating inflammatory and/or painful conditions, including rheumatism, in mammals, which comprises administering to a mammal a pharmaceutically effective amount of a compound according to any one of claims 1 to 9 or a pharmaceutically acceptable salt or solvate thereof.

4,578,394

CHOLINERGIC FUNCTION INCREASING 3-[N-(PYRIDYL) CARBAMOYL]-1,4-DIHYDROPYRIDINES

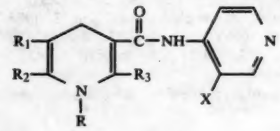
Richard C. Allen, Flemington; Richard C. Effland, and Joseph T. Klein, both of Bridgewater, all of N.J., assignors to Hoechst-Roussel Pharmaceuticals Incorporated, Somerville, N.J.

Filed Dec. 10, 1984, Ser. No. 680,036

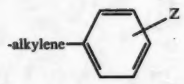
Int. Cl.[4] C07D *401/12;* A61K *31/455*

U.S. Cl. 514—332 13 Claims

1. A compound having the formula



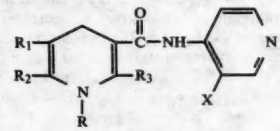
where R is loweralkyl or Arloweralkyl having a formula of



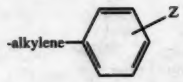
where Z is hydrogen, halogen, loweralkyl, loweralkoxy, CF_3, or NH_2; R_1, R_2 and R_3 may be the same or different and is hydrogen, loweralkyl or halogen; X is hydrogen, NH_2, or

and R_4 is hydrogen or loweralkyl.

6. A composition for increasing the cholinergic function in a mammal which comprises an effective amount for increasing the cholinergic function in a mammal of a compound having the formula



where R is loweralkyl or Arloweralkyl having a formula of



where Z is hydrogen, halogen, loweralkyl, loweralkoxy, CF_3, or NH_2; R_1, R_2 and R_3 may be the same or different and is hydrogen, loweralkyl or halogen; X is hydrogen, NH_2, or

and R_4 is hydrogen or loweralkyl; and an inert carrier.

4,578,395

CERTAIN ARALKYLAMINOALKYL ESTERS OF 1,4 DIHYDROPYRIDINES AS ANTIHYPERTENSIVE

Hisao Yamaguchi; Hideo Kanno; Yoshiaki Okamiya, all of Hino, and Kiyotaka Sunakawa, Tokyo, all of Japan, assignors to Teijin Limited, Osaka, Japan

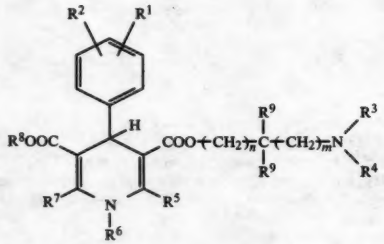
Filed Jun. 1, 1984, Ser. No. 616,515

Claims priority, application Japan, Jun. 2, 1983, 58-96995; Jun. 8, 1983, 58-100857; Nov. 9, 1983, 58-209178

Int. Cl.[4] C07D *211/90*; A61K *31/455*

U.S. Cl. 514—356 **11 Claims**

1. A 1,4-dihydropyridine derivative represented by the formula (1)



wherein

R^1 and R^2 are identical or different and each represents a hydrogen atom, a halogen atom or a nitro group, provided that R^1 and R^2 are not hydrogen atoms at the same time; R^3 represents an alkyl group; R^4 represents a benzyl or phenethyl group which may be substituted by a substituent selected from the group consisting of a halogen atom, a C_1–C_6 allyl group, a C_1–C_6 alkoxy group, and a halogenated methyl group; R^5 and R^7 are identical or different and each represents an alkyl group; R^6 represents a hydrogen atom or an alkyl group; R^8 represents an alkyl group; R^9 represents a hydrogen atom or an alkyl group; n and m are identical or different and each represents an integer of 0 to 6; provided that when either one of R^1 and R^2 is a hydrogen atom, R^9 is an alkyl group;

or an acid addition salt thereof.

8. A pharmaceutical for preventing or treating hypertension composition or angina pectoris comprising a pharmaceutically effective amount of the 1,4-dihydropyridine derivative of claim 1 or its pharmaceutically acceptable acid addition salt as an active ingredient and a pharmaceutically acceptable carrier.

4,578,396

FUNGICIDAL HYDROXYALKINYL-AZOLYL DERIVATIVES

Gerhard Jäger, Leverkusen; Klaus Böckmann, Cologne; Karl H. Büchel, Burscheid; Wilhelm Brandes, Leichlingen; Paul-Ernst Frohberger, and Hans Scheinpflug, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

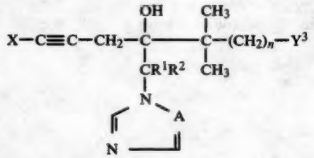
Filed May 27, 1983, Ser. No. 498,606

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1982, 3222191

Int. Cl.[4] A01N *43/50, 43/653*; C07D *233/60, 249/08*

U.S. Cl. 514—383 **7 Claims**

1. A hydroxyalkinyl-azolyl derivative of the formula



in which

A is a nitrogen atom or the CH group,

Y^3 is phenoxy or phenylthio, phenylalkoxy having 1 to 4 carbon atoms in the alkyl part or phenylalkylthio having 1 to 4 carbon atoms in the alkyl part, the phenyl substituents in turn being optionally substituted by halogen and/or alkyl having 1 to 4 carbon atoms; alkoxy or alkylthio each having 1 to 2 carbon atoms; halogenoalkyl, halogenoalkoxy or halogenoalkylthio each having 1 to 2 carbon atoms and 1 to 5 identical or different halogen atoms; cyclohexyl, dialkylamino having 1 to 4 carbon atoms is each alkyl part, nitro, cyano, or alkoxycarbonyl having 1 to 4 carbon atoms in the alkyl part; phenyl or halophenyl;

n is 0, 1 or 2;

R^1 and R^2 each independently is hydrogen or methyl, and

X is hydrogen, bromine or iodine,

or an addition product thereof with an acid or metal salt.

4,578,397

INDENO(1,2-B)PYRROLE DERIVATIVES

Tetsuya Tahara, Nakatsu, and Masafumi Arita, Tokyo, both of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

PCT No. PCT/JP83/00287, § 371 Date May 7, 1984, § 102(e) Date May 7, 1984, PCT Pub. No. WO84/00962, PCT Pub. Date Mar. 15, 1984

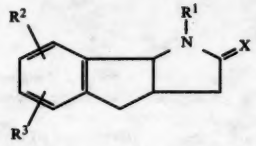
PCT Filed Aug. 30, 1983, Ser. No. 609,355

Claims priority, application Japan, Sep. 8, 1982, 57-156997

Int. Cl.[4] A61K *31/40*; C07D *209/70*

U.S. Cl. 514—411 **10 Claims**

1. An indeno[1,2-b]pyrrole compound of the formula:



wherein R^1 is hydrogen, lower alkyl or carbamoylmethyl, R^2 is halogen or trifluoromethyl, R^3 is hydrogen or halogen, and X is oxygen or sulfur.

10. A pharmaceutical composition useful for treatment of convulsion, epilepsy and anxiety comprising a pharmaceutically acceptable carrier and a therapeutically effective amount for said treatment, of a compound as defined in claim **1**.

4,578,398

SUBSTITUTED 2,3,4,9-TETRAHYDRO-1H-CARBAZOLE-1-ACETIC ACID, COMPOSITIONS AND USE

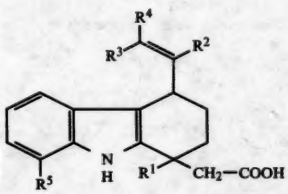
Dominick Mobilio; Christopher A. Demerson, both of Plainsboro, and Leslie G. Humber, North Brunswick, all of N.J., assignors to American Home Products Corporation, New York, N.Y.

Filed May 31, 1985, Ser. No. 740,087

Int. Cl.[4] A61K *31/40*; C07D *209/86, 209/82*

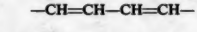
U.S. Cl. 514—411 **8 Claims**

1. A compound of the formula (I)



(I)

wherein R^1 is lower alkyl, R^2, R^3 and R^4 are hydrogen or lower alkyl or R^2 and R^4 are joined together to give



and form a benzene ring, R^5 is hydrogen, lower alkyl or halogen, and the pharmaceutically acceptable salts thereof.

7. A pharmaceutical composition comprising a compound of structure (I), or a pharmaceutically acceptable salt thereof, as defined in claim **1** and a pharmaceutically acceptable carrier.

4,578,399

USE OF THE DITERPENE DERIVATIVE FORSKOLIN FOR IMMUNOSTIMULATION

Hans-Ulrich Schorlemmer, Weimar; Gerhard Dickneite; Hans-Harald Sedlacek, both of Marburg, all of Fed. Rep. of Germany; Noel J. de Souza, and Alihussein N. Dohadwalla, both of Bombay, India, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Apr. 24, 1984, Ser. No. 603,347

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1983, 3314999

Int. Cl.[4] A61K *31/35*

U.S. Cl. 514—455 **4 Claims**

1. A method of stimulating the immune system of a mammal which comprises parenterally administering to said mammal a therapeutically effective amount of forskolin to provide immunostimulation.

4,578,400

THERAPEUTIC COMPOSITION AND METHOD FOR TREATMENT OF CARDIOVASCULAR DISEASES

Haruo Ohnishi, Funabashi; Kazuo Yamaguchi, Koganei; Yasuo Suzuki, Kawaguchi, and Nobuo Mochida, Suginami, all of Japan, assignors to Mochida Pharmaceutical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 506,216, Jun. 21, 1983, abandoned. This application Dec. 11, 1984, Ser. No. 680,593

Claims priority, application Japan, Jun. 28, 1982, 57-111183

Int. Cl.[4] A61K *31/35, 31/20*

U.S. Cl. 514—460 **55 Claims**

1. A composition for the treatment of cardiovascular diseases comprising a unit dosage form selected from the group consisting of oral preparation, injection and rectal suppository, said unit dosage containing 5–5000 mg of at least one active compound selected from the group consisting of 5-hydroxydecanoic acid, a salt thereof, and a methyl, ethyl and dihydroxypropyl ester thereof and one or more pharmaceutically acceptable excipients.

4,578,401

MENTAL COMPLEXES HAVING AN ANTINEOPLASTIC ACTION, AND MEDICAMENTS CONTAINING THESE COMPLEXES

Heimo Keller; Bernhard Keppler, both of Heidelberg; Uwe Krüger, and Rudolf Linder, both of Constance, all of Fed. Rep. of Germany, assignors to Byk Gulden Lomberg Chemische Fabrik GmbH, Constance, Fed. Rep. of Germany

PCT No. PCT/EP82/00184, § 371 Date Apr. 29, 1983, § 102(e) Date Apr. 29, 1983, PCT Pub. No. WO83/00868, PCT Pub. Date Mar. 17, 1983

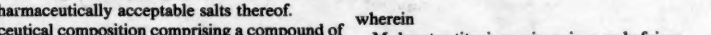
PCT Filed Aug. 28, 1982, Ser. No. 491,337

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1981,

Int. Cl.[4] A01N *55/04*; C07F *7/00, 7/28*; A61K *31/32*

U.S. Cl. 514—49 **20 Claims**

5. A medicament composition comprising pharmaceutically-acceptable excipient and from 0.1 and 99.5 percent by weight of at least one metal complex of the general formula I,



(I),

wherein

M denotes titanium, zirconium or hafnium,

R^1 denotes hydrogen, C_1–C_8-alkyl or phenyl, which is optionally monosubstituted or polysubstituted by fluorine, chlorine, bromine, nitro, C_1–C_4-alkyl, C_1–C_4-alkoxy or trifluoromethyl,

R^2 denotes C_1–C_8-alkyl, or phenyl, which is optionally monosubstituted or polysubstituted by fluorine, chlorine, bromine, nitro, C_1–C_4-alkyl, C_1–C_4-alkoxy or trifluoromethyl,

R^3 denotes hydrogen or phenyl,

R^4 denotes C_1–C_{18}-alkyl, which is optionally substituted by hydroxyl, C_1–C_3-alkylamino or alkali-metal sulfonato, or denotes C_5–C_8-cycloalkyl, which is optionally substituted by C_1–C_5-alkyl, hydroxyl or alkali-metal sulfonato,

X denotes fluorine, chlorine or bromine,

m denotes the number 0 or 1, but does not denote 0 when R^1 denotes hydrogen, and

n denotes the number 0 or 1,

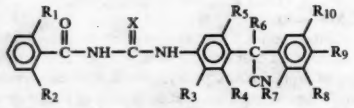
and, when R^4 contains an amino group, a hydrohalide thereof; the medicament composition comprising from 0.1 to 500 milligrams of metal complex per unit dose.

4,578,402
PESTICIDAL ALPHA-CYANOBENZYL PHENYL BENZOYL UREA COMPOUNDS

Themistocles Damasceno J. D'Silva, Chapel Hill, N.C., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 15, 1985, Ser. No. 712,195
Int. Cl.[4] A01N *37/34;* C07C *121/78*
U.S. Cl. 514—521 35 Claims

1. A compound of the formula:



wherein:

R_1 and R_2 are independently hydrogen, halogen, C_{1-6} alkyl, haloalkyl, polyhaloalkyl, alkoxy, haloalkoxy or polyhaloalkoxy, provided that at least one of R_1 and R_2 is other than hydrogen;

R_3, R_4 and R_5 are independently hydrogen, halogen, C_{1-6} alkyl, haloalkyl, polyhaloalkyl, alkoxy, haloalkoxy, polyhaloalkoxy, carboxylic acid, carboxylic acid salt or carboxylic acid ester;

R_6 is hydrogen or C_{1-6} alkyl;

R_7, R_8, R_9 and R_{10} are independently hydrogen, halogen, C_{1-6} alkyl, haloalkyl, polyhaloalkyl, alkoxy, haloalkoxy, polyhaloalkoxy, carboxylic acid, carboxylic acid salt, carboxylic acid ester, cyano or nitro; and

X is oxygen or sulfur.

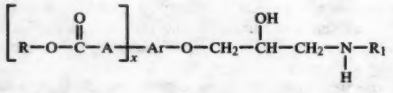
25. A method of controlling pests which comprises subjecting said pests to a pesticidally effective amount of the compound of claim 1.

4,578,403
METHOD FOR TREATING GLAUCOMA BY THE TOPICAL ADMINISTRATION OF SELECTIVELY METABOLIZED BETA-BLOCKING AGENTS

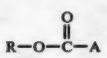
William L. Matier, Libertyville, Ill., assignor to American Hospital Supply Corporation, Evanston, Ill.

Division of Ser. No. 276,658, Jun. 23, 1981, Pat. No. 4,454,154.
This application Jun. 11, 1984, Ser. No. 619,184
Int. Cl.[4] A61K *31/275, 31/235, 31/24*
U.S. Cl. 514—522 17 Claims

1. A method for treating glaucoma or for lowering intraocular pressure in a mammal, which comprises topically applying to the eye of such mammal an intraocular pressure-lowering effective amount of a compound represented by the formula:



wherein R represents lower alkyl of straight or branched carbon chains from 1 to about 10 carbon atoms, lower cycloalkyl of from 3 to about 5 carbon atoms, lower alkenyl of from 2 to about 5 carbon atoms, lower alkynyl of from 2 to about 5 carbon atoms, lower alkyl carboxymethyl in which the alkyl portion contains from 1 to about 5 carbon atoms, aryl carboxymethyl in which the aryl portion contains from 6 to about 8 carbon atoms, aryl of from 6 to about 10 carbon atoms or aralkyl wherein the alkyl portion contains from about 1 to about 5 carbon atoms and the aryl portion represents substituted or unsubstituted monocyclic or polycyclic aromatic of from 6 to about 10 carbon atoms; A is a direct bond, lower alkylene or lower alkenylene; x is an integer from 1 to 3, provided that when x is greater than 1, different occurrences of the



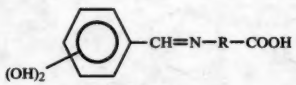
group may be the same or different; Ar is phenyl or napthyl substituted with acetamido, amino, nitro, lower alkylamino, hydroxy, lower hydroxyalkyl, or cyano; R_1 is lower alkyl, lower hydroxyalkyl, lower alkenyl, lower alkynyl, or aralkyl; or a pharmaceutically acceptable salt thereof.

4,578,404
PHARMACEUTICAL COMPOSITION FOR TREATING NEPHRITIS AND METHOD FOR TREATING NEPHRITIS

Hitoshi Takita; Sakuo Noda, both of Tokyo; Yutaka Mukaida, Moroyama, and Hidetoshi Kobayashi, Tokyo, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

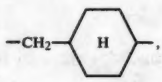
Filed Apr. 6, 1984, Ser. No. 597,601
Claims priority, application Japan, Apr. 15, 1983, 58-66674
The portion of the term of this patent subsequent to Mar. 22, 2000, has been disclaimed.
Int. Cl.[4] A61K *31/195*
U.S. Cl. 514—567 8 Claims

1. A pharmaceutical composition for treating nephritis, comprising 0.01 to 100% by weight of at least one compound selected from the group consisting of the derivatives of N-(dihydroxybenzylidene)amino acid, represented by the formula (I):



(I)

wherein R represents an alkylene group having one to five carbon atoms, a phenylene group or



the pharmaceutically acceptable salts thereof and the pharmaceutically acceptable esters thereof and a pharmaceutically acceptable carrier therefor.

4,578,405
METHODS FOR TREATING INFLAMMATION

Martin M. Rieger, Morris Plains, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed May 29, 1985, Ser. No. 738,920
Int. Cl.[4] A61K *31/015, 31/12*
U.S. Cl. 514—679 8 Claims

1. A method for treatment of inflammation in a mammal comprising administering to the mammal a therapeutically effective amount of an agent selected from the group consisting of 1-phenyl-1-cyclohexene, 4-phenylcyclohexanone, and mixtures thereof.

4,578,406

CONDUCTIVE POLYURETHANE FOAM AND PROCESS OF CONTACTING A POLYURETHANE FOAM WITH A MIXTURE OF SWELLING AGENT AND CHEMICAL ADDITIVE

Robert A. Volz, West Chester, Pa., assignor to Scotfoam Corporation, Eddystone, Pa.

Filed Dec. 20, 1984, Ser. No. 684,012
Int. Cl.[4] C08G *18/14*
U.S. Cl. 521—52 22 Claims

1. A process for modifying the electrical conductivity of a polyurethane foam comprising;

(a) contacting the polyurethane foam with a mixture of a swelling agent for the polyurethane foam and an electrical conductivity increasing chemical additive, which is soluble or miscible in the swelling agent for a time sufficient to swell the foam to at least a ten percent increase in its original volume and interpenetrate the foam with the chemical additive,

(b) shrinking the interpenetrated polyurethane foam by removing the swelling agent under conditions whereby at least 1%, by weight of the foam, of the chemical additive remains trapped in the polymeric structure of the polyurethane foam.

4,578,407

THIXOTROPIC RUST REMOVAL COATING AND PROCESS

Robert N. Amabile, Garfield; Richard E. Judd, Bloomingdale, and Stanley J. Gromelski, Jr., West Caldwell, all of N.J., assignors to GAF Corporation, Wayne, N.J.

Filed Mar. 31, 1982, Ser. No. 364,117
Int. Cl.[4] B08B *7/00*; C11D *3/37, 7/32*; C08L *5/00*
U.S. Cl. 524—55 14 Claims

1. A spreadable thixotropic coating composition having a pH between 1.5 and 7.0 said composition being suitable for removing rust from metal surfaces and consisting essentially of:

(a) an effective film forming and rust removing amount of polyvinylpyrrolidone;

(b) an effective solvent amount of water; and

(c) an effective thixotropic amount of thixotropic agent selected from the group consisting of xanthan gum and water-soluble crosslinked interpolymer consisting essentially of substantially equimolar quantities of maleic anhydride and monovinyl alkyl ether wherein the alkyl group contains from 1 to 4 carbon atoms and 0.001 to 0.2 mole per mole of the monovinyl alkyl ether of a crosslinking agent having a formula selected from the class consisting of

$$H_2C{=}CH{-}O{-}X_1{-}OCH{=}CH_2$$

and

$$H_2C{=}CH(OX_2)_nOCH{=}CH_2$$

where X_1 represents an alkylene group of two to twelve carbon atoms and X_2 represents an alkylene group of two to four carbon atoms and n represents an integer of 2 to 100.

4,578,408

POLYESTER RESIN COMPOSITION RESISTANT AGAINST DISCOLORATION BY LIGHT

Masatoshi Matsuoka; Yukio Ikenaga, both of Fuji, and Osamu Matsuno, Hyogo, all of Japan, assignors to Polyplastics Co., Ltd., Japan

PCT No. PCT/JP81/00370, § 371 Date Aug. 6, 1982, § 102(e) Date Aug. 6, 1982, PCT Pub. No. WO82/02053, PCT Pub. Date Jun. 24, 1982
PCT Filed Dec. 7, 1981, Ser. No. 414,251
Int. Cl.[4] C08K *5/34, 5/11, 3/22*
U.S. Cl. 524—91 18 Claims

1. A photodiscoloration-resistant polyester resin composition comprising 100 parts by weight of a polyester resin and, incorporated therein, (1) 3 to 50 parts by weight of a brominated cyanuric acid ester compound; and (2) a benzotriazole-type ultraviolet stabilizer in an amount of up to 5 parts by weight per 100 parts by weight of the polyester resin; wherein the composition has a Hunter color difference, ΔE, of less than 10, as performed before and after a treatment wherein a molded article composition is exposed to irradiation for 200 hours by a sunshine weatherometer under conditions of 63° C. for 12 minutes and 60 minutes water spraying; and wherein

$$\Delta E = \sqrt{(L - L_o)^2 + (a - a_o)^2 + (b - b_o)^2}$$

wherein L_o, a_o and b_o are values of the Hunter color before irradiation and L, a and b are values of the Hunter color after irradiation.

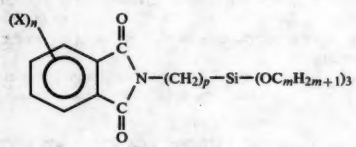
4,578,409

FLAME RETARDING SILANES

Sivaram Krishnan, Pittsburgh, Pa.; Ulrich R. Grigo, Kempen, Fed. Rep. of Germany, and Donald A. Folajtar, Pittsburgh, Pa., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Jan. 14, 1985, Ser. No. 691,102
Int. Cl.[4] C08K *5/34*
U.S. Cl. 524—94 11 Claims

1. The compound



wherein X is a halogen atom, n is 1–4, p is 1–9 and m is 1–5.

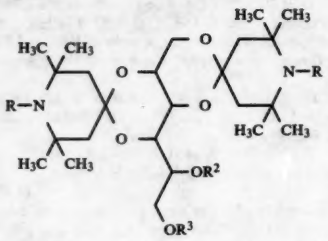
4,578,410

PIPERIDINE DERIVATIVES, THEIR PRODUCTION AND STABILIZED POLYMER COMPOSITIONS CONTAINING SAME

Yukoh Takahashi; Takeo Fujii, both of Toyonaka; Masahisa Shionoya, Izumi; Shinichi Yachigo, Toyonaka, and Tamaki Ishii, Suita, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

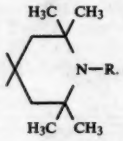
Filed Aug. 27, 1984, Ser. No. 644,680
Claims priority, application Japan, Sep. 5, 1983, 58-163734; May 10, 1984, 59-94371; May 21, 1984, 59-103362
Int. Cl.[4] C08K *5/34*
U.S. Cl. 524—102 20 Claims

1. A piperidine derivative represented by the formula (I).



(I)

wherein R represents a hydrogen atom or a C_1–C_3 alkyl group, and R^2 and R^3 represent a hydrogen atom or taken together, form



4,578,411

PROCESS FOR MAKING POWDERED RUBBER

William Budd, Cuyahoga Falls, and Paul H. Sandstrom, Tallmadge, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 10, 1984, Ser. No. 649,233

Int. Cl.[4] C08K *3/04*

U.S. Cl. 524—156 **18 Claims**

1. A process for the production of tack-free, pourable, filler containing elastomer powder which comprises;

(a) dispersing a carbon black filler in water;

(b) mixing the thus dispersed cabon black filler with an elastomer solution and an anionic surfactant to produce an elastomer emulsion;

(c) coagulating the elastomer emulsion;

(d) partitioning the coagulated elastomer emulsion with a coating resin which is comprised of at least one copolymer containing from 70% to 97% by weight vinyl aromatic monomers and from 3% to 30% by weight diene monomers; and

(e) filtering, washing and drying the resultant powder.

4,578,412

EXTENDED AMINE CURING AGENTS [AND EPOXY RESINS CURED THEREWITH]

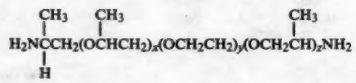
Kathy B. Sellstrom, and Harold G. Waddill, both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 510,848, Jul. 5, 1983, Pat. No. 4,552,933. This application Mar. 11, 1985, Ser. No. 710,263

Int. Cl.[4] C08L *75/04*

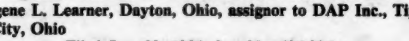
U.S. Cl. 524—243 **22 Claims**

1. A composition for use in the curing of a 1,2-epoxy resin consisting essentially of a solution of a cured elastomeric polyurethane formed by reaction injection molding in a 1,2-epoxy-interactive polyether polyamine or a Mannich condensate of said polyether polyamine with a phenol and formaldehyde, said polyether polyamine having a formula as follows:



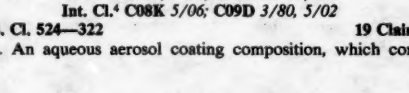
(I)

wherein x+z=about 2 to 10 and y equals about 1 to 50; or



II

wherein x is a number having a value of about 2 to 40; or



III

wherein x, y and z represent numbers in the range of about 1 to 15 and the sum of x, y and z is from about 3 to 50.

4,578,413

POLYMERIC TUBINGS COMPRISING POLYSILOXANE-MODIFIED ELASTOMER COMPOSITIONS

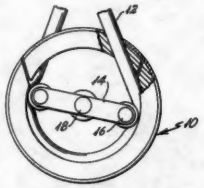
Robert E. Sterling, New Port Richey, Fla., assignor to Medical Research Associates, Ltd. #2, Clearwater, Fla.

Filed Dec. 21, 1983, Ser. No. 563,825

The portion of the term of this patent subsequent to Nov. 6, 2001, has been disclaimed.

Int. Cl.[4] C08L *25/10, 9/06;* A01N *1/00*

U.S. Cl. 524—269 **21 Claims**



1. A tubing formed of a polymeric composition comprising a thermoplastic elastomeric hydrocarbon block copolymer and a polysiloxane having a kinematic viscosity of 20 to 10^6 centistokes at room temperature, the polysiloxane constituting from about 0.1 to 12 percent by weight of the composition, the balance being the copolymer.

4,578,414

WETTABLE OLEFIN POLYMER FIBERS

Lawrence H. Sawyer, and George W. Knight, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 581,397, Feb. 17, 1984, abandoned. This application Feb. 19, 1985, Ser. No. 703,077

Int. Cl.[4] C08K *5/10, 5/11;* C08L *91/00*

U.S. Cl. 524—310 **49 Claims**

1. Wettable fibers or filaments prepared from a composition comprising an olefin polymer having incorporated therein a wetting agent, said wetting agent comprising at least one of (a) an alkoxylated alkyl phenol along with, or in combination with, a mixed mono-, di- and/or tri-glyceride, or (b) a polyoxyalkylene fatty acid ester, or (c) a combination of (b) and any part of (a).

4,578,415

AQUEOUS AEROSOL COATING COMPOSITION

Eugene L. Learner, Dayton, Ohio, assignor to DAP Inc., Tipp City, Ohio

Filed Jun. 29, 1984, Ser. No. 626,306

Int. Cl.[4] C08K *5/06;* C09D *3/80, 5/02*

U.S. Cl. 524—322 **19 Claims**

1. An aqueous aerosol coating composition, which com-

prises a water soluble ammonium or amine salt of a drying oil-modified copolymer of an alkyl acrylate of 3 to 5 carbon atoms in the alkyl moiety and an alkyl methacrylate having 3 to 5 carbon atoms in the alkyl moiety, having an average molecular weight of not more than about 9,000, a water soluble organic solvent, water and dimethyl ether.

4,578,416

FLAME RETARDANT HIGH IMPACT POLY PARAMETHYLSTYRENE COMPOSITIONS

Viren P. Trivedi, Old Bridge, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 31, 1982, Ser. No. 413,590

Int. Cl.⁴ C08K *5/06*

U.S. Cl. 524—371 **2 Claims**

1. A non-foamed, flame-retarded article comprising:

a. a methyl styrene resin containing at least 20% by weight of polymerized units derived from a mixture of methylstyrene isomers consisting essentially of 0–0.1 percent by weight ortho-methylstyrene, 0–15 percent by weight meta-methylstyrene, and at least 85 percent by weight para-methylstyrene, and 0–80 percent by weight of a different ethylenically unsaturated monomer; and

b. a sufficient amount of flame-retardants comprising an antimony compound and a halide flame-retardant, to achieve at least a V-1 flame-retardancy under UL-94 test wherein the V-1 flame-retardancy is achieved by the addition of antimony oxide and decabromodiphenyl oxide and wherein the amount of flame-retardants is substantially less than that required for polystyrene analogs to achieve the same degree of flame-retardancy.

4,578,417

STABILIZED MOISTURE CURABLE COMPOSITION

Hisao Furukawa, Kobe; Keiko Okada, Osaka; Joe Kawamura, and Yasushi Kato, both of Kobe, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 2, 1984, Ser. No. 657,101

Claims priority, application Japan, Oct. 3, 1983, 58-185693

Int. Cl.⁴ C08K *5/06;* **C08L** *43/04*

U.S. Cl. 524—378 **11 Claims**

7. A composition comprising (A) a silyl group-containing vinyl polymer whose main chain consists essentially of a vinyl polymer and which has on the polymer chain end or a side chain thereof at least one silicon atom to which a hydrolyzable group is linked per one polymer molecule,

(B) an orthoacetic acid ester of the formula;

$$H_3CC(OR^1)_3$$

wherein R^1 is a monovalent hydrocarbon group having 1 to 16 carbon atoms,

(C) a catalyst for curing said silyl group-containing vinyl polymer (A), and

(D) A solvent for the silyl group-containing vinyl polymer (A) and the catalyst (C).

11. The composition of claim 7, wherein said solvent contains an alkyl alcohol.

4,578,418

TWO-PACKAGE URETHANE MAINTENANCE PRIMER

Achim R. Krueger, Cherry Hill, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 574,250, Jan. 26, 1984, Pat. No. 4,522,879, which is a continuation-in-part of Ser. No. 314,972, Oct. 26, 1981, abandoned. This application Dec. 31, 1984, Ser. No. 688,024

Int. Cl.⁴ C08K *3/08, 5/09*

U.S. Cl. 524—400 **4 Claims**

1. A coating composition comprising at least one inert anhydrous organic solvent containing

a binder formed from at least one polymeric polyol having 1–10% by weight of hydroxyl, a number average molecular weight of about 500–10,000 and a solubility of at least 30% by weight in the solvent;

a pigment mixture containing (1) at least 20% by weight of a pigment in the form of platelets (2) about 1–5% by weight of carbon black, and (3) about 1–5% by weight of barium lanolate;

the pigment/binder weight ratio being in the range of 60/100–600/100;

an organic polyisocyanate; and

dispersed therein, a finely divided sacrificial metal selected from the group consisting of zinc, aluminum and magnesium.

4,578,419

IODINE COMPOUND ACTIVATION OF AUTODEPOSITION BATHS

Wilbur S. Hall, Springvale, Me., assignor to Amchem Products, Inc., Ambler, Pa.

Filed Mar. 28, 1985, Ser. No. 717,259

Int. Cl.⁴ C08K *3/00, 3/16*

U.S. Cl. 524—401 **24 Claims**

1. An aqueous acidic autodeposition composition for depositing a resinous coating on an iron- and/or zinc-containing metal substrate, comprising a resinous latex, an inorganic acid, and an oxidizer, all present in amounts effective to deposit said coating, wherein: said latex polymer is a copolymer; and said oxidizer is elemental iodine complexed with a water soluble iodide, an iodate salt or free acid, a periodate salt or free acid, or any mixture of the foregoing.

4,578,420

ERASER WITH THERMOPLASTIC BINDER

Werner Handl, Altdorf, Fed. Rep. of Germany, assignor to J. S. Staedtler, Nuremburg, Fed. Rep. of Germany

Filed Feb. 10, 1981, Ser. No. 233,292

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1980, 3005332

Int. Cl.⁴ C08K *5/01;* **C08L** *53/02*

U.S. Cl. 524—490 **3 Claims**

1. In an eraser composed of fillers and a binder of a thermoplastic material of a synthetic rubber, the improvement consisting essentially of said binder being a styrene-butadiene-styrene block polymer with a butadiene portion of 10 to 40% and containing a straight-chain or branched aliphatic hydrocarbon compound having a formula ranging between $C_{18}H_{38}$ to $C_{43}H_{88}$.

4,578,421

MATERIAL INTENDED TO FORM A JOINT BETWEEN TWO BODIES ON THE OUTSIDE OF THEIR INTERFACE, METHODS OF PRODUCING ASSEMBLIES WITH SUCH MATERIAL; ASSEMBLIES THUS OBTAINED

Jean-Louis Tournier, Riom, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Filed Jun. 13, 1983, Ser. No. 503,757

Claims priority, application France, Jul. 2, 1982, 82 11800

Int. Cl.⁴ C08L *47/00, 61/04, 9/00*

U.S. Cl. 524— 311 **14 Claims**

1. A material intended to form a joint between at least two bodies on the outside of their interface, at least one of the bodies being deformable, characterized by the following features:

(a) it is a mixture comprising at least one solvent and at least one elastomer, said mixture having a Brookfield viscosity, measured at 20° C., of from 0.3 Pa.s to 700 Pa.s;

(b) this mixture has a volatile part which can be evaporated at 20° C., 1 bar, to yield a dry extract which is from 20% by weight to 80% by weight, based on the weight of the mixture;

(c) the dry extract of the mixture comprises an elastomer fraction at least 20% by weight of which elastomer fraction is formed of at least one unsaturated elastomer capable of cross-linking either at ambient temperature of by heating for a period of time of less than one minute;
(d) the dry extract comprises from 3 to 9 parts by weight of sulfur per 100 parts by weight of the elastomer fraction;
(e) the dry extract comprises at least two cross-linking accelerators belonging to different families selected from the group consisting of xanthates, amines and
carbamates, in the following proportions, per 100 parts by weight of the elastomer fraction;
xanthate or total xanthates: 1 to 4 parts by weight;
amine or total amines: 0.2 to 1 part by weight; carbamate or total carbamates: 2 to 4 parts by weight;
(f) the dry extract comprises at least one cross-linking accelerator metallic oxide selected from among zinc oxide (ZnO), lead oxide (PbO_2) and magnesium oxide (MgO), the proportion of the oxide or of the total oxides being from 2 to 10 parts by weight per 100 parts by weight of the elastomer fraction.

4,578,422

ACETAL RESIN COMPOSITION

Masanori Sakurai; Junichi Miyawaki; Toshikaju Umemura; Toshikatsu Kawata, and Shinji Kiboshi, all of Toyonaka, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

PCT No. PCT/JP83/00335, § 371 Date May 23, 1984, § 102(e) Date May 23, 1984, PCT Pub. No. WO84/01579, PCT Pub. Date Apr. 26, 1984
PCT Filed Oct. 8, 1983, Ser. No. 619,145
Claims priority, application Japan, Oct. 8, 1982, 57-177133
The portion of the term of this patent subsequent to Mar. 19, 2002, has been disclaimed.
Int. Cl.[4] C08K *3/72, 3/34*
U.S. Cl. 524—593 **12 Claims**

1. An acetal resin composition comprising
(A) an acetal resin,
(B) at least one member selected from the group consisting of
(1) a polyfunctional cyanate ester or its prepolymer,
(2) a mixture of a polyfunctional cyanate ester or its prepolymer and a polyfunctional maleimide or its prepolymer, and
(3) a prepolymer of a polyfunctional cyanate ester and a polyfunctional maleimide,
(C) an amino-substituted triazine and/or a cyanoguanidine compound, and
(D) glass fibers and/or granular or powdery glass.

4,578,423

POLYBLENDS OF POLYPHENYLENE OXIDE AND STYRENE-ACRYLONITRILE POLYMERS HAVING BROAD ACRYLONITRILE COMPOSITIONAL DISTRIBUTION

Gary L. Deets, St. Peters, Mo., and Quirino A. Trementozzi, Springfield, Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 12, 1983, Ser. No. 560,287
Int. Cl.[4] C08L *25/12, 55/02, 71/04*
U.S. Cl. 525—68 **8 Claims**

1. A polyblend comprising:
(a) from about 10 to about 90% by weight of a polyphenylene oxide; and
(b) from about 90 to about 10% by weight of a polymer comprising from 87 to 63% by weight of a vinyl aromatic monomer, from 8 to 17 average % by weight of an unsaturated nitrile monomer and from 0 to 20% by weight of a rubber having a glass transition temperature below 0° C., said polymer having a broad compositional distribution of said unsaturated nitrile monomer in that the standard deviation of the weight % unsaturated nitrile monomer is at least about 3.5%.

4,578,424

HIGH PERFORMANCE TWO-COMPONENT EPOXY STRUCTURAL ADHESIVES WITH CHEMICAL THIXOTROPY

Anil B. Goel, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed May 3, 1985, Ser. No. 730,142
Int. Cl.[4] C08G *59/56, 59/58, 59/60*
U.S. Cl. 525—109 **11 Claims**

1. A two component adhesive formulation comprising a mixture of
A. An epoxy component comprising an epoxy resin and an additive selected from the group consisting of (a) a polyisocyanate, (b) a carboxylic anhydride and (c) molecules with unsaturated carbon-carbon bonds capable of undergoing Michael addition reaction with amines, and
B. A hardener component for curing component A comprising a mixture of amido amines, primary and secondary amines having tertiary amine groups or ether groups in their backbone and bisphenol-A.

4,578,425

PHENOLIC RESINS, CARBOXYLIC RESINS AND THE ELASTOMERS CONTAINING ADHESIVE

Michael Santorelli, Schenectady, N.Y., assignor to Schenectady Chemicals, Inc., Schenectady, N.Y.

Filed Feb. 13, 1985, Ser. No. 701,205
Int. Cl.[4] C08L *63/02*
U.S. Cl. 525—109 **16 Claims**

1. An adhesive composition comprising:
(a) 4–72% by weight phenol-aldehyde resin or a resin of an ethylenically unsaturated phenol;
(b) 4–72% by weight 1,2 epoxy resin;
(c) 10–80% by weight of an ethylene acrylic elastomer; wherein the ratio of phenol-aldehyde to 1,2 epoxy resin is from 1:4 to 4:1.

4,578,426

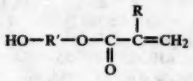
PRODUCTION OF COATINGS

Werner Lenz, Bad Durkheim; Hans Sander, Ludwigshafen, and Dieter Moeller, Ascheberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 25, 1984, Ser. No. 624,293
Claims priority, application Fed. Rep. of Germany, Jun. 24, 1983, 3322830
Int. Cl.[4] C08F *8/00;* **C08L** *75/00*
U.S. Cl. 525—131 **20 Claims**

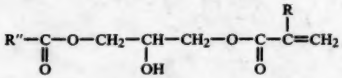
1. A process for the production of a coating based on a reaction product of
(A) a mixture of
(A1) a polyhydroxypolyacrylate resin obtained from an ester of acrylic acid or methacrylic acid with a monofunctional aliphatic alcohol, or a mixture of esters of acrylic acid and mehtacrylic acid with monofuctional aliphatic alcohols, a monoester of acrylic acid or methacrylic acid with a polyfunctional aliphatic alcohol, or a mixture of monoesters of acrylic acid and methacrylic acid woth polyfunctional aliphatic alcohols, and other compolymerizable olefinically unsaturated monomers, and
(A2) a polyesterpolyol whcih is soluble in organic solvents with
(B) a polyisocyanate which is unblocked or partially or completely blocked with CH-, NH- or OH-acidic blocking agents, contains isocyanurate groups and may or may not contain biuret groups and has a functionality of from 2.5 to 6,
wherein the polyhydroxypolyacrylate resin (A1) used comprises from 40 to 99% by weight of hydroxyl-containing copolymers consisting of

(a) from 6 to 70% by weight of one or more esters of the formula



where R is hydrogen or methyl and R' is a straight-chain or branched alkylene radical of 2 to 18 carbon atoms or alkylene of 7 to 17 carbon atoms which contains one, two or three cycloaliphatic groups,

(b) from 0 to 50% by weight of one or more hydroxylalkyl esters of acrylic acid or methacrylic acid of the formula



where R is hydrogen or methyl and R'' is the alkyl radical of a branched aliphatic carboxylic acid of 4 to 26 carbon atoms,

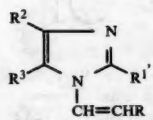
(c) from 10 to 50% by weight of one or more alkyl esters of acrylic acid or methacrylic acid, which form homopolymers having a glass transition temperature of from +5° to +120° C.,

(d) from 0 to 10% by weight of a vinylaromatic,

(e) from 10 to 60% by weight of one or more alkyl esters or alkylglycol esters of acrylic acid or methacrylic acid, which form homopolymers which have a glass transition temperature of from −80° to +4.5° C., the alkylglycol esters containing not more than 2 ether oxygen bridges,

(f) from 0 to 10% by weight of an acrylamide or a methacrylamide which may or may not be substituted at the amide nitrogen atom by one or two alkyl radicals of 1 to 8 carbon atoms which may or may not contain a carbonyl group, or by one or two phenyl radicals,

(g) from 1 to 25% by weight of one or more polymerizable olefinically unsaturated heterocyclic compodnds of the formula



(I)

where R^1, R^2 and R^3 are each hydrogen, methyl, ethyl, a straight-chain or branched alkyl radical of 3 or 4 carbon atoms, or phenyl which is unsubstituted or substituted by alkyl of 1 to 4 carbon atoms or by halogen or nitro, or R^2 and R^3 can form an aromatic six-membered ring which is unsubstituted or substituted by alkyl of 1 to 4 carbon atoms or by halogen or nitro, which ring is fused to the heterocyclic ring and

(h) from 0 to 20% by weight of monomers which are not included under (a) to (g) and whose copolymerized radicals are inert to isocyanate groups, with the proviso that the sum of the percentages stated under (a) and (b) is from 6 to 70, the sum of the percentages stated under (c), (d) and (g) is from 11 to 60, and the sum of the percentages of the components stated under (a) to (h) is 100, the polyesterpolyol (A2) used comprises from 1 to 60% by weight of a hydroxyl-containing polyester which has a hydroxyl number of from 30 to 500 and an acid number of from 0 to 30 and is soluble in conventional surface coating solvents or solvent mixtures which are inert to isocyanates and essentially contain one or more aromatic, halogen, ether, ester or keto groups, or several different groups from amongst these, and this polyesterpolyol (A2) can also contain as much as 10% by weight of a polyfunctional alcohol having a molecular 1 weight of from 62 to 300, with the proviso that the sum of the percentages stated under (A1) and (A2) is 100, and the polyisocyanate (B) used, which contains isocyanurate groups, may or may not contain biuret groups and has a functionality of from 2.5 to 6 comprises (B1) from 60 to 100% by weight of an isocyanurate-containing polyisocyanate which possesses predominantly cycloaliphatically bonded isocyanate groups, and (B2) from 0 to 40% by weight of a polyisocyanate which contains biuret or isocyanurate groups or both biuret and isocyanurate groups and possesses predominantly aliphatically bonded isocyanate groups, with the proviso that the sum of the percentages stated under (B1) and (B2) is 100.

4,578,427

COATING RESIN COMPOSITION

Teruo Saito, Shiga; Kuniaki Asai, Osaka, and Kazuo Hieda, Hyogo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jan. 24, 1985, Ser. No. 694,366
Claims priority, application Japan, Jan. 24, 1984, 59-11484
Int. Cl.[4] C08L *27/18, 27/20, 61/00*
U.S. Cl. 525—150 **7 Claims**

1. A coating resin composition comprising from 50 to 99% by weight of a thermoplastic aromatic polyether ketone resin and from 50 to 1% by weight of perfluoroalkoxy resin or a tetrafluoroethylene/hexafluoropropylene compolymer having a hexafluoropropylene content of from 18 to 25% by weight.

4,578,428

MODIFIED OLEFINE POLYMERS AND PROCESS FOR THEIR MANUFACTURE

Luciano Clementini, and Leonardo Spagnoli, both of Terni, Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Dec. 16, 1983, Ser. No. 561,995
Int. Cl.[4] C08F *255/02, 255/04, 8/06*
U.S. Cl. 525—265 **8 Claims**

1. A process for manufacturing modified polymers consisting of polymers selected from crystalline, prevailingly isotactic polypropylene and crystalline propylene/ethylene copolymers made up, prevailingly, of polymerized propylene units, prepared by means of stereospecific catalysts grafted with unsaturated carboxylic acids, having a high adhesiveness to metals, comprising a preliminary step of peroxidizing the starting polymer or copolymer by means of a treatment at 70°–120° C. with organic peroxide having an average life >30 minutes at 100° C., the successive mixing with the unsaturated carboxylic acid and the grafting reaction of the latter being accomplished in the absence of solvents, at a temperature of 180°–220° C. in the presence of a different organic peroxide having an average life ≦30 seconds at 200° C.

4,578,429

SELECTIVELY HYDROGENATED BLOCK COPOLYMERS MODIFIED WITH ACID COMPOUNDS OR DERIVATIVES

William P. Gergen, Houston; Robert G. Lutz, Spring, and Richard Gelles, Houston, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 31, 1984, Ser. No. 646,391
Int. Cl.[4] C08L *53/02;* **C08F** *279/04*
U.S. Cl. 525—291 **30 Claims**

1. A functionalized selectively hydrogenated block copolymer of the formula ABA to which has been grafted an acid compound or its derivative wherein,

(1) each A is predominantly a polymerized monoalkenyl aromatic hydrocarbon block having an average molecular weight of about 2,000 to 115,000;

(2) each B prior to hydrogenation is predominantly a polymerized conjugated diene hydrocarbon block having an average molecular weight of about 20,000 to 450,000;

(3) the blocks A constituting 5–95 weight percent of the copolymer;

(4) the unsaturation of the block B is less than 10% of the original unsaturation;
(5) the unsaturation of the A blocks is above 50% of the original unsaturation;
(6) and substantially all of the acid compounds or their derivatives are grafted to the block copolymer at secondary or tertiary carbon positions in the B blocks;
(7) and wherein said acid compounds and their derivatives are not easily polymerizable.

4,578,430

CONTROLLED DEGRADATION OR CRACKING OF ALPHA-OLEFIN POLYMERS

Sol Davison, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 19, 1984, Ser. No. 683,748
Int. Cl.[4] C08J *7/12*
U.S. Cl. 525—387 **7 Claims**

1. In the process for the degradation modification of a propylene homopolymer or copolymer having a melt flow of about 0.2 to about 20, which process comprises adding about 0.0001 to about 1.0 parts by weight of a peroxide to 100 parts by weight of said homopolymer or copolymer and heating the resulting mixture in a melt extruder at a temperature of from about 150° C. to about 300° C., the improvement wherein the rate of addition of said peroxide is cyclically varied at a frequency with a period longer than the decomposition time of said peroxide, but shorter than the passage time of said mixture through said extruder, so as to achieve the desired melt flow and molecular weight distribution for said homopolymer or copolymer, wherein

(a) said peroxide decomposition time is the half-life of the peroxide at the temperature in said extruder;
(b) said peroxide has a half-life at about 1 second to about 30 seconds at the temperature in said extruder;
(c) said passage time in said extruder is between about 0.5 and about 5 minutes; and
(d) said peroxide is cyclically varied by a method selected from the group consisting of:
(i) pulsed square addition having a relatively short period of high peroxide addition alternating with a relatively long period of no peroxide addition;
(ii) pulsed square addition having a relatively long period of high peroxide addition alternating with a relatively short period of no peroxide addition;
(iii) pulsed square addition having alternating periods of high addition of peroxide and low addition of peroxide; and
(iv) continuously changing rate of addition of peroxide according to a sinusoidal wave pattern.

4,578,431

PROCESS FOR IMPROVING MELT STRENGTH OF ETHYLENE POLYMERS BY TREATMENT WITH ORGANIC PEROXIDE

Richard G. Shaw, Bradley Beach, and Peter J. Canterino, Towaco, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 31, 1983, Ser. No. 528,197
Int. Cl.[4] C08F *8/08*
U.S. Cl. 525—387 **9 Claims**

1. A process treating a film-forming copolymer of ethylene and an olefin having 4 to 8 carbons atoms, or of a high density ethylene homopolymer, comprising:

heating said ethylene copolymer in melt form at a temperature of from about 230° C. to 340° C. in the presence of an effective amount of from 100 ppm to 2000 ppm of an organic peroxide for a period of time equal to at least three times the half-life of the organic peroxide at the heating temperature to increase the melt strength of said copolymer so that the copolymer is suitable for extrusion into a film by blown film extrusion.

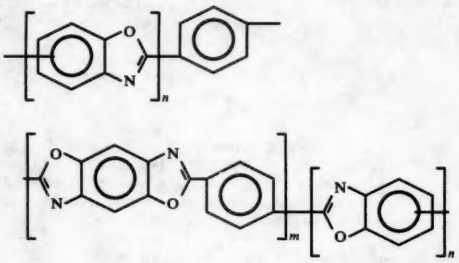
4,578,432

METHOD FOR MAKING HETEROCYCLIC BLOCK COPOLYMER

Tsu-Tzu Tsai, Dayton, and Fred E. Arnold, Centerville, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

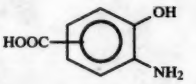
Division of Ser. No. 610,912, May 16, 1984, Pat. No. 4,544,713.
This application Apr. 11, 1985, Ser. No. 721,835
Int. Cl.[4] C08G *73/22*
U.S. Cl. 525—432 **12 Claims**

1. A method for preparing a thermally stable aromatic heterocyclic block copolymer of the general formula



wherein m is an integer equal to the number of repeating units of the rigid rod segment and n is an integer equal to the number of repeating units of the flexible end segments, which comprises the steps of

(a) reacting 2,4-dihydroxy-p-phenylenediamine with terephthalic acid in polyphosphoric acid (PPA) under reaction conditions to form carboxy-terminated rigid rod segments;
(b) adding an amino monomer of the general formula



to the reaction mixture of PPA and rigid rod segments, and polymerizing said amino monomer to form flexible segments grafted onto said rigid rod segments; and
(c) recovering the resulting block copolymer.

4,578,433

LONG-TERM STABILITY OF THE ELECTRICAL CONDUCTIVITY OF PYRROLE POLYMERS

Helmut Muenstedt, Wachenheim, and Herbert Naarmann, Wattenheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 20, 1984, Ser. No. 684,035
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1983, 3346935
Int. Cl.[4] C25C *1/00*
U.S. Cl. 525—417 **6 Claims**

1. A process for improving the long-term stability of the electrical conductivity of a pyrrole polymer, wherein the polymer is subsequently treated with an aqueous acid as a separate step.

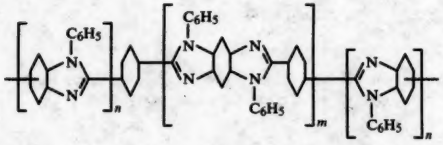
4,578,434

METHOD FOR MAKING HETEROCYCLIC BLOCK COPOLYMER

Tsu-Tzu Tsai, Dayton, and Fred E. Arnold, Centerville, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 610,912, May 16, 1984, Pat. No. 4,544,713.
This application Apr. 11, 1985, Ser. No. 722,028
Int. Cl.[4] C08G *73/06*
U.S. Cl. 525—432 12 Claims

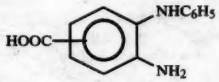
1. A method for preparing a thermally stable aromatic heterocyclic block copolymer of the general formula



wherein m is an integer equal to the number of repeating units of the rigid rod segment and n is an integer equal to the number of repeating units of the flexible end segments, which comprises the steps of

(a) reacting 1,4-diamino-2,5-dianilinobenzene with terephthalic acid in polyphosphoric acid (PPA) under reaction conditions to form carboxy-terminated rigid rod segments;

(b) adding an amino monomer of the general formula



to the reaction mixture of PPA and rigid rod segments, and polymerizing said amino monomer to form flexible segments grafted onto said rigid rod segments; and

(c) recovering the resulting block copolymer.

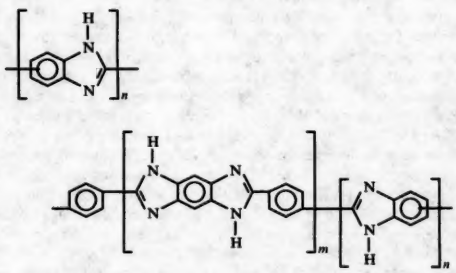
4,578,435

METHOD FOR MAKING HETEROCYCLIC BLOCK COPOLYMER

Tsu-Tzu Tsai, Dayton, and Fred E. Arnold, Centerville, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 610,912, May 16, 1984, Pat. No. 4,544,713.
This application Apr. 11, 1985, Ser. No. 721,973
Int. Cl.[4] C08G *73/06*
U.S. Cl. 525—432 6 Claims

1. A method for preparing a thermally stable aromatic heterocyclic block copolymer of the general formula



wherein m is an integer equal to the number of repeating units of the rigid rod segment and n is an integer equal to the number of repeating units of the flexible end segments, which comprises the steps of

(a) reacting 1,2,4,5-tetraaminobenzene with terephthalic acid in polyphosphoric acid (PPA) under reaction conditions to form carboxy-terminated rigid rod segments;

(b) adding 2,3-diaminobenzoic acid to the reaction mixture of PPA and rigid rod segments, and polymerizing said 2,3-diaminobenzoic acid to form flexible segments grafted onto said rigid rod segments; and

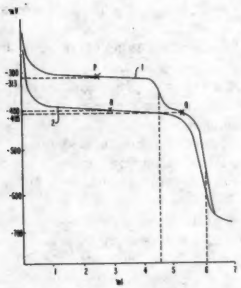
(c) recovering the resulting block copolymer.

4,578,436

COATING RESINOUS COMPOSITION CONTAINING SATURATED ALICYCLIC ACID MODIFIED AMPHOTERIC POLYESTER RESIN

Hirotoshi Umemoto, Uji; Hisaki Tanabe, Yawata; Akihiro Kanakura, Hirakata, and Shinji Nakano, Takatsuki, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

PCT No. PCT/JP83/00293, § 371 Date May 2, 1984, § 102(e) Date May 2, 1984, PCT Pub. No. WO84/00971, PCT Pub. Date Mar. 15, 1984
PCT Filed Sep. 2, 1983, Ser. No. 608,698
Claims priority, application Japan, Sep. 3, 1982, 57-154210
Int. Cl.[4] C08F *20/00*
U.S. Cl. 525—443 7 Claims



1. A coating use resinous composition comprising 60～90% by weight of amphoteric polyester resin obtained by the reaction of polyester resin (A) comprising alcohol and acid components, 10～80 mole % of the acid components being a saturated alicyclic polycarboxylic acid and 10～100 mole % of the carboxyl groups capable of developing a resinous acid value, said carboxyl groups being derived from a polycarboxylic acid showing a titration midpoint potential in a non-aqueous potentiometric titration, under a state capable of developing a resinous acid value, of more than −350 mV, and (B) a member selected from the group consisting of a basic resin and a basic compound or mixtures thereof, and 40～10% by weight of an amino-formaldehyde resin etherified with monohydric alcohol having 1 to 4 carbon atoms, said basic resin and basic compound both containing in its molecule at least one function group capable of reacting with the ester and at least one functional group with a nitrogen atom having a lone pair of electrons.

4,578,437
COPOLYESTER/POLYESTER BLENDS HAVING REDUCED CARBON DIOXIDE PERMEABILITY

Ronald R. Light, and Robert W. Seymour, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 519,475, Aug. 1, 1983, abandoned. This application Oct. 19, 1984, Ser. No. 662,643

Int. Cl.[4] C08L *67/02*

U.S. Cl. 525—444 **6 Claims**

1. A polyester blend, particularly useful in film or sheet form having greatly reduced carbon dioxide permeability, said blend being formed by admixing under essentially non-transesterification conditions and in the absence of any transesterification catalyst (a) from about 40 to about 95% by weight of one or a mixture of copolyesters having an I.V. of from about 0.4 to about 1.0 prepared from (1) an acid component comprising from about 70 to 100 mole % terephthalic acid and up to about 30 mole % of one or a mixture of isophthalic acid, 2,6-naphthalenedicarboxylic acid, and 1,4-cyclohexanedicarboxylic acid, and (2) a glycol component comprising from about 50 to about 80 mole % ethylene glycol, from about 20 to about 50 mole % 1,4-cyclohexanedimethanol, up to about 5 mole % diethylene glycol, and up to about 15 mole % of one or a mixture of modifying diols, and (b) from about 5 to about 60% by weight of poly(ethylene isophthalate) having an I.V. of from about 0.4 to about 1.0.

4,578,438
PREPARATION OF RESINOUS PRODUCTS

Christopher G. Demmer, and Roderick D. Hathaway, both of Cambridge, England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 11, 1985, Ser. No. 710,641

Int. Cl.[4] C08L *63/10;* **C08G** *59/14, 59/16, 59/18*

U.S. Cl. 525—481 **20 Claims**

1. A water-dilutable resinous product prepared by reacting together

(A) a resin having at least one phenolic hydroxyl group and a free position ortho and/or para to a phenolic hydroxyl group, and containing a residue formed by polymerization of a vinyl monomer in the resin or in a precursor thereof,

(B) an aldehyde, and

(C) sulfurous acid or an organic acid containing a primary or secondary amino group or a mercaptan group and a carboxylic, sulfonic or phosphonic acid group, or a water-soluble salt thereof.

5. A resinous product according to claim 1, in which (A) is a resin obtained by reacting en epoxide resin with a polyhydric phenol having a free position ortho and/or para to a phenolic hydroxyl group to produce a phenol-terminated resin and polymerizing a vinyl monomer in the phenol-terminated resin.

4,578,439
STYRYL PYRIDINE CYANATES, STYRYL PYRAZINE CYANATES AND POLYMERS THEREOF

Robert E. Hefner, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 9, 1984, Ser. No. 639,036

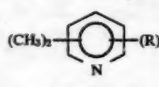
Int. Cl.[4] C08L *61/020;* **C08G** *8/28*

U.S. Cl. 525—509 **33 Claims**

1. A styryl pyridine cyanate or styryl pyrazine cyanate composition resulting from cyanating a product resulting from reacting

(A) at least one of

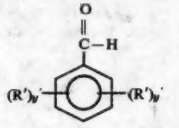
(1) one or more pyridine compounds represented by the formula



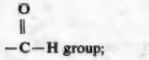
(2) one or more pyrazine compounds represented by the formula

(3) a mixture of 1 and 2; with

(B) a substitued aromatic aldehyde represented by the formula



wherein each R is independently hydrogen, hydroxyl, methyl or ethyl; each R′ is independently a hydroxyl or a



each R″ is independently hydrogen, methyl or ethyl; x has a value of 3; x′ has a value of 2; y has a value of 1 or 2; y′ has a value of 3 or 4; the sum of y and y′ has a value of 5; and with the proviso that at least one of R or R′ is a hydroxyl group and wherein

(i) components (A) and (B) are employed in quantities which provide the resultant reaction product with a reacted molar ratio of (B) to (A) of from about 0.33:1 to about 4:1 and

(ii) at least about 1 percent of the rings in the resultant reaction product of (A) and (B) contain at least one hydroxyl group which is susceptible to being cyanated.

4,578,440
POLYMERIZATION CATALYST AND METHOD

Thomas J. Pullukat, Hoffman Estates, and Raymond E. Hoff, Palatine, both of Ill., assignors to Norchem, Inc., Rolling Meadows, Ill.

Division of Ser. No. 112,560, Jan. 16, 1980, Pat. No. 4,530,913. This application Aug. 21, 1980, Ser. No. 180,481

Int. Cl.[4] C08F *4/42*

U.S. Cl. 526—128 **34 Claims**

1. The method of making polymers from polymerizable 1-olefins which comprises polymerizing at least one of said olefins under polymerizing conditions with a catalyst system comprising an alkyl or aryl aluminum compound cocatalyst and a catalyst prepared by: (1) reacting a halogen free monofunctional organic silicon compound with silica or alumina having surface hydroxyl groups or a mixture thereof, said silicon compound being reactive with said surface hydroxyl groups, followed by stripping the product of this reaction of any excess organosilicon compound and reaction by-products; (2) reacting the product of (1) with a Group IIA organometallic compound or complex of magnesium or calcium; and (3) reacting the product of (2) with a halide or alkoxide of a Group IVB of VB metal of titanium, vanadium, zirconium or mixtures of these in an amount of from 0.1–20.0 wt. % of said metal based on the weight of the catalyst; or (2′) reacting the product of (1) with an alkyl aluminum halide and a Group IIA organometallic compound or complex of magnesium or calcium prior to (3); or (1′) reacting the product of (1) with the halide or alkoxide of (3) prior to (2), the ratio by weight of said Group IIA metal to said Group IVB or VB varying from 0.1–100, and the molar ratio of cocatalyst to Group IVB or VB compounds being from 0.1:1 to 100:1.

4,578,441
EMULSION POLYMERIZATION PROCESS FOR PRODUCTION OF α-METHYLSTYRENE COPOLYMER

Osamu Murai, Osaka, and Noboru Moriyama, Wakayama, both of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Aug. 14, 1985, Ser. No. 765,906
Claims priority, application Japan, Aug. 22, 1984, 59-174441
Int. Cl.[4] C08F 2/24
U.S. Cl. 526—216 5 Claims

1. A process for producing an α-methylstyrene copolymer, which comprises the step of effecting the emulsion polymerization of α-methylstyrene and another co-monomer in the presence of a succinic acid derivative having at least one alkenyl group or a salt thereof, which has been obtained by reacting an α,β-unsaturated dicarboxylic acid having 4 to 12 carbon atoms or an anhydride thereof with an alkene having 8 to 40 carbon atoms.

4,578,442
PIEZOELECTRIC POLYMERIC MATERIAL, A PROCESS FOR PRODUCING THE SAME AND AN ULTRASONIC TRANSDUCER UTILIZING THE SAME

Hiroji Ohigashi, Zushi; Keiko Koga, Sagamihara, and Toshiharu Nakanishi, Kamakura, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation of Ser. No. 232,963, Feb. 9, 1981, abandoned. This application Jul. 5, 1983, Ser. No. 510,687
Claims priority, application Japan, Feb. 7, 1980, 55-13839; Feb. 12, 1980, 55-15860
Int. Cl.[4] C04B 35/00; C08F 214/22
U.S. Cl. 526—255 11 Claims

1. A piezoelectric, polymeric material consisting essentially of a copolymer consisting essentially of 65 to 82 mole percent of vinylidene fluoride and 38 to 18 mole percent of ethylene trifluoride, and having a thickness extensional electromechanical coupling factor (K_t) of between about 0.05 and about 0.31.

5. A process for producing a piezoelectric polymeric material which consists essentially of a copolymer consisting essentially of vinylidene fluoride and ethylene trifluoride, said process comprising heat-treating a polymeric material consisting essentially of a copolymer consisting essentially of 65 to 82 mole percent of vinylidene fluoride and 35 to 18 mole percent of ethylene trifluoride at a heat-treating temperature T(°C.) being in the range of from the temperature of 5(°C.) below the crystal phase transition temperature T'm(°C.) to the melting point temperature Tm(°C.) and then poling the heat-treated polymeric material to achieve a thickness extensional electromechanical coupling factor (K_t) of between about 0.05 and about 0.31.

4,578,443
POLYACETYLENE PRODUCTION

David C. Bott, Woking; John H. Edwards, Eaglescliffe, and William J. Feast, High Shincliffe, all of England, assignors to The British Petroleum Company P.L.C., London, England

Continuation of Ser. No. 553,850, Nov. 21, 1983, abandoned, which is a division of Ser. No. 442,147, Nov. 16, 1982, abandoned. This application May 2, 1985, Ser. No. 729,886
Claims priority, application United Kingdom, Nov. 20, 1981, 8134975
Int. Cl.[4] C08F 38/02
U.S. Cl. 526—285 13 Claims

1. A process for producing a coherent poly(acetylene) (III) film comprising solvent casting a solution of a polymer of the general formula (V) derived from a precursor (IV) an transforming the pre-cast, polymer (V) into poly(acetylene) at a temperature between 20° and 120° C. and under reduced pressure over a duration of between 1 and 100 hours in an atmosphere inert to the precursor polymer (V) and to the poly(acetylene) (III) film and a by-product (VI), wherein in the general formulae IV, V and VI represented above in the accompanying specification each of the groups R_1 and R_2
either

(a) represent a radical selected from H, CX_3, C_mH_{2m+1} and $COOR_5$ wherein X is a halogen atom, m has a value between 1 and 4 and R_5 is an alkyl group with 1–4 carbon atoms,

or

(b) form together with the respective carbon atoms to which they are attached a benzene nucleus,

and

each of R_3 and R_4
either

(c) represent H atoms,

or

(d) form together with the respective carbon atoms to which they are attached a benzene nucleus.

4,578,444
ANAEROBIC ADHESIVES CONTAINING POLYMERIZABLE ACTIVATORS

Robert D. Rossi, Levittown, Pa., and Dilip K. Ray-Chaudhuri, Bridgewater, N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

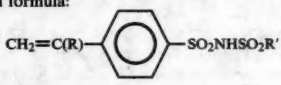
Continuation of Ser. No. 489,433, Apr. 28, 1983, abandoned. This application Oct. 1, 1984, Ser. No. 656,573
Int. Cl.[4] C08F 228/02
U.S. Cl. 526—288 8 Claims

1. An anaerobic curing adhesive composition consisting essentially of:

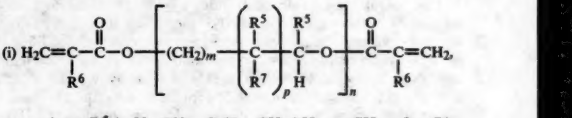
(a) at least one polymerizable acrylate or methacrylate monomer;

(b) a free radical initiator in sufficient concentration to initiate cure upon the exclusion of oxygen; and

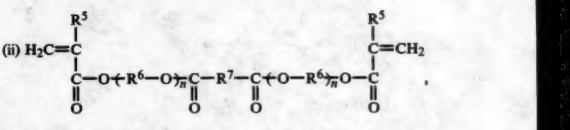
(c) a polymerizable activator therefor comprising a monomeric disulfonimide present in an amount of 0.01 to 12% by dry weight of the total composition selected from the general formula:



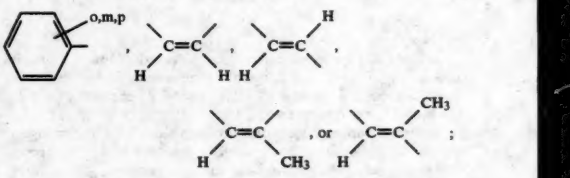
wherein R is hydrogen or methyl, and R' is alkyl, aryl, toluene or mesitylene; and wherein the acrylate or methacrylate monomer of component (a) is a member of the compounds corresponding to:



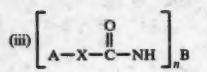
where R^5 is H, CH_3, C_2H_5, CH_2OH, or $CH_2—O—C(=O)—C(R^6)=CH_2$; R^6 is H, Cl, CH_3 or C_2H_5; R^7 is H, OH, or $O—C(=O)—C(R^6)=CH_2$; m is 1–8; n is 1–20; and p is 0–1; or



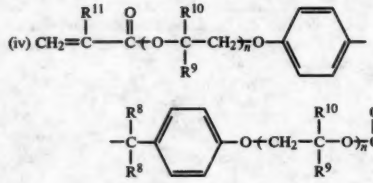
where R^5 is H, Cl, CH_3, or C_2H_5; R^6 is a C_2–C_6 alkylene; R^7 is $(CH_2)_m$,



n is 1–4; and m is 0–8; or

(iii) 

where X is O or N(R^5); R^5 is H or a C_1–C_7 alkyl; A represents the organic residue of an active-hydrogen-containing acrylate ester wherein the active hydrogen has been removed, the ester being hydroxy- or amino substituted on the alkyl portion thereof and the methyl, ethyl, and chlorine homologs thereof; B is a mono- or polyvalent organic radical selected from the group consisting of alkyl, alkylene, alkenyl, alkenylene, cycloalkyl, cycloalkylene, aryl, arylene, aralkyl, aralkylene, alkaryl, alkarylene, poly(oxyalkylene), poly(carboalkoxyalkylene), and heterocyclic radicals both substituted and unsubstituted; and n is 1–6; or

(iv) 

where R^8 is CH_3, C_2H_5, COOH, or H; R^9 is H, CH_3, or C_2H_5, R^{10} is H, CH_3, or OH; R^{11} is H, Cl, CH_3, or C_2H_5, and n is 0–8; and

monofunctional acrylate and methacrylate esters or the hydroxy, amido, cyano, chloro, or silane substituted derivatives thereof.

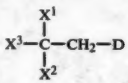
4,578,445

HALOGEN-CONTAINING LENS MATERIAL

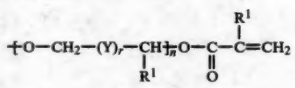
Teruo Sakagami; Yasufumi Fujii, and Naohiro Murayama, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Chuo, Japan

Filed Mar. 27, 1985, Ser. No. 716,460
Claims priority, application Japan, Mar. 27, 1984, 59-58876
Int. Cl.[4] C08F *220/22*
U.S. Cl. 526—292.3 **5 Claims**

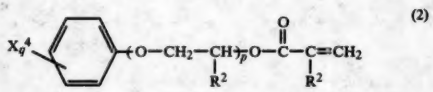
1. A lens having a refractive index n_D^{20} of at least 1.57 and an Abbé's number ν of at least 30 or more, which lens is made of a copolymer comprising: a copolymer comprising 10 to 85% by weight of a halogen-containing monomer (I) represented by the formula (1) set forth below, 15 to 90% by weight of a halogen-containing monomer (II) represented by the formula (2) set forth below, and 0 to 20% by weight of a monomer (III) copolymerizable with the above-mentioned monomers, the composition of the copolymer being based on the total quantity of the monomers (I), (II), and (III):


(1)

wherein D represents



in which: n represents an integer selected from the group consisting of 0, 1, and 2; each R^1 represents hydrogen or a methyl group; Y represents CHOH; and r represents 0 or 1; each of X^1 and X^2 represents, independently from each other, a methyl group in which one through three of the hydrogen atoms are substituted by a number selected from the group consisting of bromine, iodine and a hydroxyl group (OH group), with the proviso that the number of substitution of the OH group is only one; X^3 represents a methyl group in which one through three of the hydrogen atoms are substituted by a member selected from the group consisting of bromine, iodine and D, with the proviso that the number of substitution of D is only one; wherein at least one of X^1, X^2, and X^3 contains at least one bromine or iodine atom;


(2)

wherein each R^2 represents hydrogen or a methyl group; p represents an integer selected from the group consisting of 0, 1, 2, and 3; X^4 represents bromine or iodine; and q represents an integer selected from the group consisting of 1, 2, 3, 4, and 5.

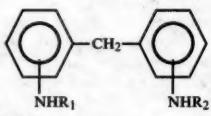
4,578,446

SECONDARY AROMATIC DIAMINES AS CURING AGENTS IN POLYURETHANE MANUFACTURING

David W. House, Arlington Heights, and Ray V. Scott, Jr., Addison, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Mar. 25, 1985, Ser. No. 715,719
Int. Cl.[4] C08G *18/32, 18/16*
U.S. Cl. 528—64 **20 Claims**

1. A polyurethane resulting from the reaction of an isocyanate terminated urethane prepolymer, said prepolymer being the adduct of from about 1.5 to about 4.0 equivalents of a polyisocyanate with one equivalent of a polyol, with from about 0.80 to about 1.2 equivalent of a secondary aromatic diamine of the structure,



where each alkyl group, R_1 and R_2, contains from 4 to about 20 carbon atoms.

4,578,447

RIM NYLON-BASED URETHANE BLOCK POLYMER COMPOSITION

William M. Humphrey, Dover, N.H., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Dec. 28, 1983, Ser. No. 566,147
Int. Cl.[4] C08G *65/32, 18/77*
U.S. Cl. 528—73 **11 Claims**

1. A nylon-based urethane block prepolymer suitable for reaction injection molding when reacted with an anionic catalyst comprising a monovalent metal caprolactam salt, said prepolymer comprising the reaction mixture of:

	Mole Ratios
Ring Lactam	600 to 1000
Polyoxyalkyl triamine	1 to 5
Polyether diol	1 to 3
Diisocyanate	6 to 14

said isocyanate being added to the liquid admixture of the other three components.

4,578,448

HIGH-ORTHO PHENOL-FORMALDEHYDE RESOLES CONTAINING HEMIFORMAL GROUPS

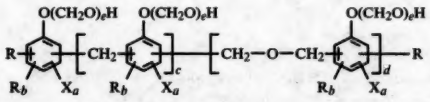
George L. Brode, and Sui-Wu Chow, both of Bridgewater Twp., Sommerset Co., N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 340,853, Jan. 20, 1982, abandoned. This application Dec. 14, 1983, Ser. No. 561,144

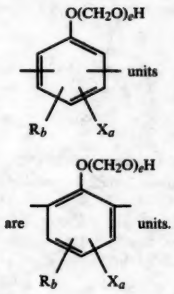
Int. Cl.[4] C08G *8/10*

U.S. Cl. 528—139 13 Claims

1. A phenol formaldehyde resin for use in a liquid injection molding process having a viscosity at 25° C. of from about 1000 centipoise to about 10,000 centipoise and containing less than about 5 weight percent unbound water and volatile organic compounds, said phenol formaldehyde resin having the general formula:



wherein a is from 0 to 3, b is 0 to 1, the sum of a and b does not exceed 3, the sum of c and d is from 2 to about 20, the mole fraction d/(c+d) is 0.4 to 0.9, e is 0 to about 5, R is $—CH_2O(CH_2O)_eH$, X is a monovalent radical, wherein for at least one of the R or $—O(CH_2O)_eH$ group e is at least 1, and wherein at least 50 mole percent of the



are units.

4,578,449

TWO-STAGE PROCESS FOR PREPARATION OF POLYPHENYLENE OXIDES

David P. Mobley, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 659,045, Oct. 9, 1984, abandoned, which is a continuation-in-part of Ser. No. 479,066, Mar. 25, 1983, Pat. No. 4,477,649, and Ser. No. 609,075, May 10, 1984, abandoned. This application Feb. 26, 1985, Ser. No. 705,812

The portion of the term of this patent subsequent to Oct. 16, 2001, has been disclaimed.

Int. Cl.[4] C08G *65/44*

U.S. Cl. 528—212 24 Claims

1. In a process for preparing polyphenylene oxides by the catalytic reaction of oxygen with at least one monohydroxyaromatic compound in solution in a solvent in which said polyphenylene oxide is also soluble, the improvement which comprises carrying out said reaction in two stages, the first stage being conducted continuously in at least one back-mixed reactor and the second stage in at least one batch reactor or continuously in a reaction system with limited back-mixing.

4,578,450

ACCELERATOR-MODIFIED ADHESION PROMOTERS FOR RUBBER TO WIRE ADHESION

William W. Schloman, Jr., Stow, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 4, 1984, Ser. No. 646,342

Int. Cl.[4] C08G *12/30*

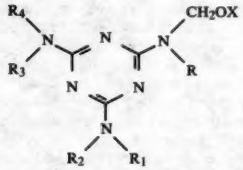
U.S. Cl. 528—254 6 Claims

1. A reaction product of:

(a) an N-(substituted oxymethyl)melamine and

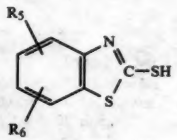
(b) a substituted 2-mercaptoarylthiazole accelerator

wherein the N-(substituted oxymethyl)melamine has the following structural formula:



I

where X is selected from the group consisting of hydrogen and alkyl radicals having 1 to 8 carbon atoms, R, R_1, R_2, R_3, and R_4 are selected from the group consisting of hydrogen, alkyl radicals having 1 to 8 carbon atoms, and $—CH_2OX$ where X is as defined above; and wherein the 2-mercaptoarylthiazole has the following structural formula:



II

where R_5 and R_6 are selected from the group consisting of: hydrogen; alkyl radical having from 1 to 8 carbon atoms; alkoxy radicals having from 1 to 4 carbon atoms; phenyl radicals either substituted or unsubstituted; amino radical; nitro radical; hydroxy radical; and halo-radicals.

4,578,451

SURGICAL FILAMENTS FROM BLOCK COPOLYETHERAMIDES

Gregory A. Weaver, Neshanic Station; Lester F. Price, Matawan; Crawford R. Britt, Plainfield, and W. Shalaby Shalaby, Lebanon, all of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Jul. 15, 1983, Ser. No. 514,371

Int. Cl.[4] C08G *69/40*; A61L *17/00*

U.S. Cl. 528—292 15 Claims

1. In a surgical filament comprising a drawn and oriented polymer, the improvement which comprises using as the polymer a block copolyetheramide consisting essentially of (a) polyamide blocks derived from C_6 to C_{12} aliphatic omega-amino-acids of lactams or the reaction product of a C_6 to C_{12} aliphatic diacid with a C_6 to C_{12} aliphatic diamine, and (b) polyether blocks consisting essentially of polyalkylene ethers wherein the individual alkylene groups are C_2 to C_6 polymethylene, wherein said surgical filament has a straight tensile strength of at least 50,000 psi and a Young's modulus below 250,000 psi.

4,578,452
METHOD FOR MANUFACTURING EPOXY RESIN MOLDED MATERIALS

Wolfgang Kleeberg, Erlangen; Klaus-Robert Hauschildt; Heinz Hacker, both of Nuremberg, and Klaus Kretzschmar, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jul. 20, 1984, Ser. No. 633,005

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1983, 3326532

Int. Cl.[4] C08G *59/24, 59/42*

U.S. Cl. 528—297 **14 Claims**

1. A method for the preparation of a leakage current-proof epoxy resin molded material comprising the steps of:

combining a di- or polycarboxylic acid glycidyl ester, 3,4-epoxycyclohexylmethyl-3',4'-epoxycyclohexane carboxylate, a dicarboxylic acid anhydride, and a reaction accelerator to form an epoxy resin molding material, wherein due to the ratio of glycidyl ester cycloaliphatic olefin epoxide present in said olefinic combination there is a synergistic increase in the rate of cross-linking of the epoxy resin composition relative to the rate at which said cycloaliphatic olefinic epoxide cross-links in the absence of said glycidyl ester; and adding to said composition an amount of a diol or polyol effective to lower the rate of cross-linking of the epoxy resin composition such that the time necessary to reach a maximum temperature during the cross-linking of the epoxy resin composition will be at least as long as the time necessary to reach the maximum temperature during the cross-linking of said glycidyl ester dicarboxylic acid anhydride components of said composition under quasi-adiabatic conditions, and placing said composition in a suitable mold and then heating said composition.

4,578,453
HIGH MOLECULAR WEIGHT POLYESTERS

Winston J. Jackson, Jr., and Joseph J. Watkins, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 23, 1984, Ser. No. 674,117

Int. Cl.[4] C08G *63/16, 63/18, 63/68*

U.S. Cl. 528—302 **10 Claims**

1. A high molecular weight polyester suitable for use in forming shaped articles, said polyester having an inherent viscosity of greater than 0.4 and containing repeating units from a glycol component consisting essentially of 1,3-cyclohexanedimethanol, 1,4-cyclohexanedimethanol or mixtures thereof, and an acid component comprising at least 50 mole % of an alicyclic or aromatic dicarboxylic anhydride or corresponding acid having 6 to 30 carbon atoms.

4,578,454
POLYAMINOAMIDES CONTAINING POLYALKYLPIPERIDINE RADICALS

Giuseppe Cantatore, Bitonto, Italy, assignor to Ciba-Geigy S.p.A., Origgio, Italy

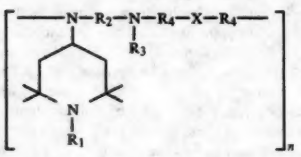
Filed May 8, 1984, Ser. No. 608,081

Int. Cl.[4] C08G *69/14*

U.S. Cl. 528—327 **3 Claims**

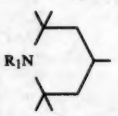
1. A compound of the general formula

(I)

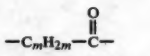


in which R_1 is hydrogen, O., CH_2CN, C_1–C_{12}-alkyl, C_3–C_{12}-alkenyl or -alkynyl, substituted or unsubstituted C_7–C_{12}-aralkyl or C_1–C_{12}-acyl, R_2 is C_2–C_{18}-alkylene, C_5–C_{18}-cycloalkylene, C_6–C_{18}-arylene or C_7–C_{18}-aralkylene, R_3 is hydrogen, C_1–C_{18}-alkyl, C_5–C_{18}-cycloalkyl, substituted or unsubstituted C_6–C_{18}-aryl, substituted or unsubstituted C_7–C_{18}-aralkyl or a radical of the formula (II)

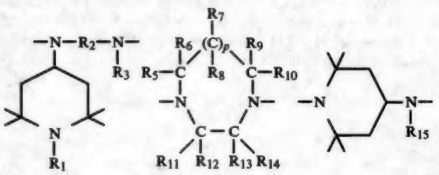
(II)



in which R_1 is as defined above, the R_4's are



radicals wherein both carbonyl groups are attached either to X or to N and in which m is an integer from 1 to 12, X is a divalent radical containing 1 or more heterocyclic radicals of the formula (III), (IV) or (V)



(III) (IV) (V)

in which R_1, R_2 and R_3 are as defined above, p is zero or 1, R_5, R_6, R_7, R_8, R_9, R_{10}, R_{11}, R_{12}, R_{13} and R_{14} are hydrogen or methyl, R_{15} is hydrogen, C_1–C_{18}-alkyl, C_5–C_{18}-cycloalkyl, substituted or unsubstituted C_6–C_{18}-aryl, substituted or unsubstituted C_7–C_{18}-aralkyl or a radical of the formula (II), and N is an interger from 2to 100.

4,578,455
PROCESS AND APPARATUS FOR REMOVING VOLATILE CONSTITUENTS FROM POLYMER MELTS OR PASTES

Gunter Pipper, Bad Durkheim; Siegfried Riegger, Mannheim, and Josef G. Floss, Neustadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 591,596, Mar. 20, 1984, abandoned. This application Apr. 18, 1985, Ser. No. 724,500

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1983, 3310676

Int. Cl.[4] C08F *6/28*

U.S. Cl. 528—501 **1 Claim**

1. A process for removing volatile constituents from a polymer melt in a vented extruder, which comprises

(a) passing the polymer melt containing the volatile constituents through one or more zones, with continuous formation of fresh surfaces,

(b) evaporating volatile constituents from this polymer melt in one or more such zones, and

(c) removing the vapors of volatile constituents, thus produced, from the zone or zones via a porous plate having a porosity of from 25 to 60% and a pore diameter of from 5 to 200 μm.

4,578,456

ETHOXYLATED LIGNITE COMPOSITION AND METHOD OF PREPARING

Kenneth W. Pober, Houston, Tex., assignor to NL Industries, Inc., New York, N.Y.

Filed Apr. 12, 1984, Ser. No. 599,449
Int. Cl.[4] C07G 1/00; C10C 1/20
U.S. Cl. 530—502 12 Claims

1. A method of ethoxylating lignite comprising:

reacting lignite containing less than about 3.5% by weight water, in a substantially oxygen-free atmosphere, with ethylene oxide in the presence of an alkali metal alkylate catalyst and an inert reaction solvent, said ethylene oxide and said lignite being present in a weight ratio of ethylene oxide to lignite of from about 2:1 to about 100:1, said catalyst being present in an amount of from about 1 to about 75% by weight based on the weight of said lignite, said lignite and said ethylene oxide being present in a combined amount of from about 11.5 to about 39% by weight of the total weight of said lignite, said ethylene oxide and said solvent, said reacting being carried out at a temperature of about 130° C. or greater.

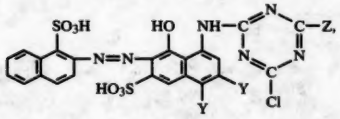
4,578,457

REACTIVE MONO-AZO DYES AND THE PREPARATION AND USE THEREOF

Herbert Seller, Riehen, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

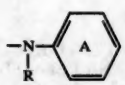
Continuation of Ser. No. 407,962, Aug. 13, 1982, abandoned. This application Aug. 29, 1984, Ser. No. 645,878
Claims priority, application Switzerland, Aug. 26, 1981, 5512/81
Int. Cl.[4] C09B 62/08
U.S. Cl. 534—632 5 Claims

1. A reactive dye of the formula



(1)

wherein Z is a radical of the formula



(2)

wherein R is C_2–C_4alkyl and the phenyl ring A is further unsubstituted or substituted by methyl, chlorine or sulfo; and one Y is hydrogen and the other Y is sulfo.

4,578,458

MUCOID EXOPOLYSACCHARIDE VACCINE AGAINST *PSEUDOMONAS AERUGINOSA*

Gerald B. Pier, Brookline, Mass., assignor to Brigham and Women's Hospital, Boston, Mass.

Filed Mar. 23, 1983, Ser. No. 477,958
Int. Cl.[4] C08B 37/00; A61K 39/104; C12P 19/04
U.S. Cl. 536—123 3 Claims

1. A bacterial antigen comprising isolated mucoid exopolysaccharide comprising a polymer uronic acid formed principally from mannuronic and guluronic acids having the antigenic characteristics of *Pseudomonas aeruginosa* 2192.

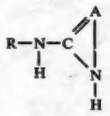
4,578,459

HETEROCYCLIC ALKYLAMINOHETEROCYCLES

Graham J. Durant, Welwyn Garden City; John C. Emmett, Codicote, and Charon R. Ganellin, Welwyn Garden City, all of England, assignors to SmithKline & French Laboratories Limited, Welwyn Garden City, England

Division of Ser. No. 422,806, Sep. 24, 1982, Pat. No. 4,467,087, which is a division of Ser. No. 206,819, Nov. 14, 1980, Pat. No. 4,374,251, which is a division of Ser. No. 7,755, Jan. 30, 1979, Pat. No. 4,260,744, which is a division of Ser. No. 778,812, Mar. 17, 1977, Pat. No. 4,153,793, which is a division of Ser. No. 619,724, Oct. 6, 1975, Pat. No. 4,035,374, which is a division of Ser. No. 463,647, Apr. 24, 1974, Pat. No. 3,932,644. This application Jun. 8, 1984, Ser. No. 618,869
Claims priority, application United Kingdom, May 3, 1973, 21063/73; Jul. 26, 1973, 35551/73
Int. Cl.[4] C07D 285/16, 239/02
U.S. Cl. 544—8 5 Claims

1. A compound of the formula:



wherein A taken together with the nitrogen and carbon atoms shown forms a quinazoline, thiazoline, or quinoline ring or when Het is other than imidazole, A taken together with the nitrogen and carbon atoms shown may form a pyrimidine, imidazoline, pyridine, benzothiadiazine or 1,2,4-thiadiazine ring, said ring having a keto, thione or sulfone group and optionally substituted by one or two lower alkyl, phenyl or benzyl groups; R is a grouping of the formula:

$$Het—CH_2Z(CH_2)_n—$$

wherein Het is a nitrogen containing heterocyclic ring selected from imidazole, pyridine, thiazole, isothiazole or thiadiazole, said ring being optionally substituted by lower alkyl, amino, hydroxy or halogen; Z is sulphur or a methylene group and n is 2 or 3 or a pharmaceutically acceptable acid addition salt thereof.

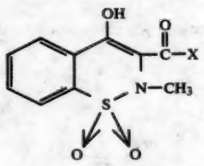
4,578,460

N-6-AMINOPURINYL-4-HYDROXY-2-METHYL-2H-1,2-BENXOTHIAZINE-3-CARBOXAMIDE 1,1-DIOXIDE COMPOUND

Giorgio A. Francia, Milan, Italy, assignor to Francia Farmaceutici s.r.l., Italy

Filed Oct. 4, 1983, Ser. No. 539,073
Claims priority, application Italy, Oct. 22, 1982, 23888 A/82
Int. Cl.[4] C07D 279/02
U.S. Cl. 544—49 1 Claim

1. A derivative of 4-hydroxy-2-methyl-2H-1,2-benzothiazine-3-carboxamide 1,1-dioxide of the formula:



(I)

in which X represents a radical of 6-aminopurine, aminoimidazole, glutamic acid, aspartic acid, histidine, or lysine.

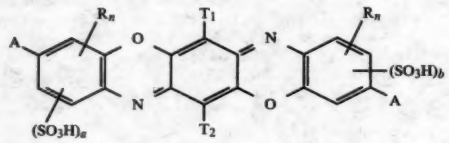
4,578,461

TRIPHENDIOXAZINE DYESTUFFS

Horst Jäger, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

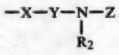
Filed Nov. 20, 1984, Ser. No. 673,259
Claims priority, application Fed. Rep. of Germany, Dec. 7, 1983, 3344254
Int. Cl.[4] C07D *498/04;* C09B *19/00*
U.S. Cl. 544—76 2 Claims

1. Dyestuffs of the formula



wherein

A=



X=—O—, —S— or —NR_1—,

R_1=H, C_1–C_4-alkyl or, together with R_2, =alkylene,

Y=C_2–C_6-alkylene which can be interrupted by N, O, S or CO and can be substituted by OH, sulpho or carboxyl,

R_2=H, C_1–C_4-alkyl, aralkyl or aryl,

Z=a non-fibre-reactive radical of the formula —SO_2B or —CONHB wherein

B=alkyl, cycloalkyl, aralkyl or aryl,

T_1 and T_2=H, halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy or aryl,

R=halogen, carboxyl, C_1–C_4-alkyl or C_1–C_4-alkoxy,

n=0 or 1,

a and b=0 or 1 such that a+b=1 or 2 and each of the sulpho groups is in the o-position relative to A.

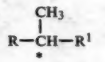
4,578,462

PROCESS FOR THE MANUFACTURE OF OPTICALLY ACTIVE COMPOUNDS

Hans-Jürgen Hansen, Riehen; Rudolf Schmid, Basel, and Max Schmid, Brugg, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

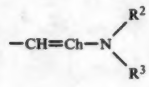
Filed Aug. 22, 1983, Ser. No. 525,529
Claims priority, application Switzerland, Aug. 27, 1982, 5110/82; Jul. 1, 1983, 3642/83
Int. Cl.[4] C07C *93/10;* C07D *295/08*
U.S. Cl. 544—177 10 Claims

1. An optically active bifunctional compound of the formula



I

wherein R is a protected hydroxymethyl; and R^1 is



(Ia)

in which R^2 and R^3 individually are lower alkyl or cycloalkyl or R^2 and R^3 taken together with the nitrogen atom of Ia are a heterocyclic ring.

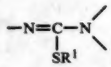
4,578,463

PRODUCTION OF S-SUBSTITUTED ISOTHIOUREAS

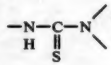
Dennis E. Jackman, Prarie Village, and Dietmar B. Westphal, Lenexa, both of Kans., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Jul. 18, 1984, Ser. No. 632,136
Int. Cl.[4] C07D *253/00, 239/02;* C07C *119/18*
U.S. Cl. 544—182 12 Claims

1. In the production of an S-substituted isothiourea including the functional group



in which R^1 is an alkyl, alkenyl, aryl or aralkyl radical, wherein a thiourea including the functional group

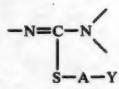


is reacted with an etherifying agent to replace H by R^1, the improvement which comprises effecting the reaction in two steps, in the first step reacting the thiourea starting material with an alpha-activated etherifying agent of the formula X—A—Y in which

X is halogen

A is a direct bond or CH_2, and

Y is an electron withdrawing group thereby to produce the ether



and in the second step reacting the ether with a compound of the formula R^1SH.

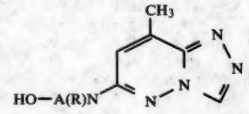
4,578,464

6-HYDROXYALKYLAMINO-8-METHYL-1,2,4-TRIAZOLO-[4,3-B]PYRIDAZINE AND RELATED COMPOUNDS

Robert J. Cregge, Zionsville, Ind., and John E. Coutant, Loveland, Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed Nov. 22, 1983, Ser. No. 554,475
Int. Cl.[4] C07D *487/04;* A61K *31/41*
U.S. Cl. 544—236 7 Claims

1. A compound of the formula



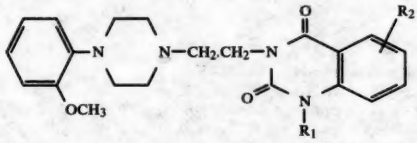
wherein A and R are selected so that A represents a straight-chain alkylene of 2–5 carbon atoms and R represents hydrogen; or the two groups are combined so that HO-A(R)N- represents hydroxy-1-piperdinyl.

4,578,465
PHENYLIPERAZINE DERIVATIVES

Hiroyuki Nagano; Mitiro Takagi; Noboru Kubodera, all of Saitama; Isao Matsunaga; Hiroyuki Nabata, both of Tokyo; Yasuhiro Ohba, Kanagawa; Kazushige Sakai, Tokyo; Shun-ichi Hata, Kanagawa, and Yasumi Uchida, Chiba, all of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 473,317, Mar. 8, 1983, abandoned. This application Apr. 30, 1984, Ser. No. 604,415
Claims priority, application Japan, Mar. 17, 1982, 57-40904
Int. Cl.[4] C07D *403/06;* A61K *31/505*
U.S. Cl. 544—285 5 Claims

1. A phenylpiperazine derivative of the formula:



(I)

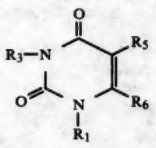
wherein R_1 is a hydrogen atom or a straight- or branched-chain saturated or unsaturated alkyl group having 1 to 8 carbon atoms which may be substituted at any position by a hydroxyl group, a carboxyl group, a lower alkoxycarbonyl group or an oxo group; and R_2 is a hydrogen atom, a halogen atom, a lower alkyl group or a sulfamoyl group.

4,578,466
PROCESSES FOR THE PREPARATION OF 6-ARYLURACILS

Harvey I. Skulnick; Herman W. Smith; Robert J. Smith, and Wendell Wierenga, all of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

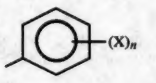
Division of Ser. No. 512,497, Jul. 11, 1983, Pat. No. 4,495,349. This application Sep. 17, 1984, Ser. No. 651,495
Int. Cl.[4] C07D *239/10, 265/06*
U.S. Cl. 544—309 4 Claims

1. A process for the preparation of a compound having the formula



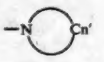
I_1

wherein R_1 is
(a) hydrogen,
(b) alkyl of from 1 to 4 carbon atoms, inclusive, or
(c) benzyl with the proviso that if R_1 is alkyl it is only a straight chain;
wherein R_3 is hydrogen; R_5 is hydrogen; and R_6 is

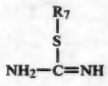


III_6

wherein n is a number of from 0 to 3, inclusive; and
X is hydroxy, alkyl of from 1 to 8 carbon atoms, inclusive; alkoxy of from 1 to 5 carbon atoms, inclusive; alkylthio of from 1 to 5 carbon atoms, inclusive; halogen; $—NX_1X_2$; aminoalkyl of from 1 to 3 carbon atoms, inclusive; nitro; benzyl; phenyl; furyl; pyridyl; or thiophene; and wherein X_1 and X_2 are the same or different and are alkyl of from 1 to 8 carbon atoms, inclusive; or taken together with —N are a saturated cycloalkylamino group

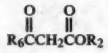


wherein n′ is 3, 4, 5 or 6 or dialkyl substituted cycloalkylamino, wherein each alkyl is from 1 to 3 carbon atoms, inclusive; which comprises
step (1) contacting an acid salt of alkylthiopseudourea of the formula



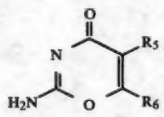
VI

wherein R_7 is alkyl of from 1 to 3 carbon atoms, inclusive; with a compound having the formula



V

wherein R_6 is as defined above, and R_2 is alkyl of from 1 to 8 carbon atoms, inclusive;
in the presence of a strong base to prepare a compound having the formula



III

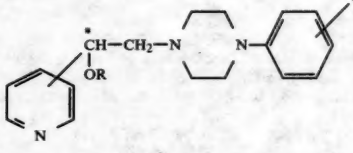
wherein R_5 and R_6 are as defined above; and
step (2) isolating the compound prepared in step (1) and converting it to the compound of formula I_1.

4,578,467
PROCESS FOR THE PREPARATION OF 1-PYRIDYL-ALKYL-4-ARYL PIPERAZINES WHICH ARE USEFUL AS ANTIHYPERTENSIVE COMPOUNDS, THEIR SEPARATION INTO THE RESPECTIVE OPTICAL ANTIPODES, AND THE STEREOISOMERIC COMPOUNDS SO OBTAINED

Graziano Bonacchi; Mauro Fedi, and Mario Giannini, all of Florence, Italy, assignors to Malesci S.p.A. Instituto Farmacobiologico, Florence, Italy

Filed Jul. 3, 1984, Ser. No. 627,583
Claims priority, application Italy, Jul. 11, 1983, 48664 A/83
Int. Cl.[4] C07D *401/06, 401/12;* A61K *31/495*
U.S. Cl. 544—360 8 Claims

1. A process for the preparation of compounds of the general formula



(I)

wherein:
the pyridine ring is alpha-, beta- or gamma-substituted;
R=H; C_nH_{2n+1}, n being in the range from 1 to 4;
R′=H, halogen, CH_3, OCH_3;

which process is characterized in that:

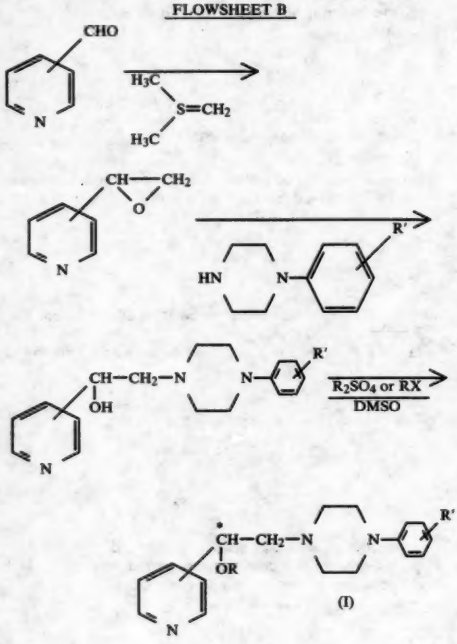
(a) pyridine aldehyde is reacted at a temperature from −5° to 0° C. with $(CH_3)_2S{=}CH_2$;

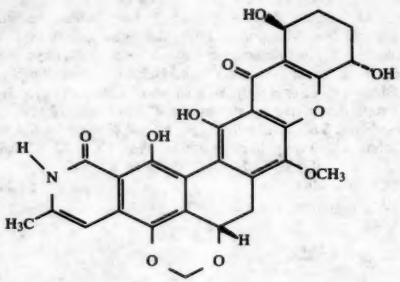
(b) the oxirane so obtained is treated with an aryl piperazine;

(c) the hydroxyl derivative obtained in step (b), after salification with alkaline hydrides or hydrates in a solvent medium, is treated with alkylating agents,

according to the following flowsheet:

FLOWSHEET B





(b) a molecular weight of 521 (FAB-MS);

(c) a molecular formula: $C_{27}H_{23}NO_{10}$;

(d) a specific optical rotation: $[\alpha]_D^{26} = +770 \pm 10°$ (C 0.165, DMF);

(e) characteristic ultraviolet absorption spectra as shown in FIG. I of the attached drawings;

(f) a characteristic infrared absorption spectrum as shown in FIG. II of the attached drawings;

(g) a characteristic proton nuclear magnetic resonance spectrum as shown in FIG. III of the attached drawings; and

(h) a characteristic carbon-13 nuclear magnetic resonance spectrum as shown in FIG. IV of the attached drawings with significant peaks at: 19.1; 25.9; 26.9; 29.7; 62.0; 62.2; 65.0; 72.8; 91.1; 100.1; 110.5; 110.6; 111.7; 114.7; 119.2; 127.2; 128.8; 136.1; 136.3; 137.0; 138.1; 148.9; 151.9; 153.0; 165.3; 167.2; 183.6.

4,578,468

ANTIBIOTIC LL-D42067β

Guy T. Carter; Donald B. Borders, both of Suffern; Joseph J. Goodman, Spring Valley, all of N.Y., and David P. Labeda, Peoria, Ill., assignors to American Cyanamid Company, Stamford, Conn.

Filed Mar. 26, 1984, Ser. No. 593,159

Int. Cl.⁴ C07D *498/12*

U.S. Cl. 546—35 **1 Claim**

1. The compound designated as LL-D42067β wherein the compound has:

(a) the relative stereochemistry and structure:

4,578,469

BENZO[DE]PYRANO[3,2-G]ISOQUINOLINE DERIVATIVES USEFUL AS DYESTUFFS

Hans-Matthias Deger, Hofheim am Taunus; Rüdiger Erckel, Eppstein, and Horst Frühbeis, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

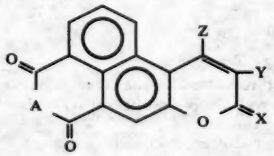
Continuation of Ser. No. 380,350, May 20, 1982, abandoned. This application Sep. 26, 1984, Ser. No. 655,307

Claims priority, application Fed. Rep. of Germany, May 22, 1981, 3120402

Int. Cl.⁴ C07D *471/04*

U.S. Cl. 546—66 **8 Claims**

1. A coumarin of the formula



in which

A is >N—R wherein R is

hydrogen, alkyl of from 1 to 18 carbon atoms, or alkyl of from 1 to 18 carbon atoms mono-, di- or trisubstituted by fluorine, chlorine or bromine, or mono- or disubstituted by alkoxy of from 1 to 4 carbon atoms, dialkylamino of from 2 to 8 carbon atoms, sulfodialkylamide of from 2 to 8 carbon atoms or cyano, the di- or tri-substituents being the same or not all the same; or is a moiety selected from the group consisting of cyclopentyl, cyclohexyl, cycloheptyl, phenyl, naphthyl, pyridyl, pyrimidyl, benzoxazolyl, benzothiozolyl and benzimidazolyl, or said moiety mono-, di- or trisubstituted at one or more nuclear carbon

atoms by fluorine, chlorine or bromine, or mono- or disubstituted at one or more nuclear carbon atoms by alkyl of from 1 to 4 carbon atoms, alkoxy of from 1 to 4 carbon atoms, hydroxyl, cyano, sulfonamide or sulfodialkylamide of from 2 to 8 carbon atoms, the di- or tri-substituents being the same or not all the same;

X is oxygen or >N—R' wherein R' is

a moiety selected from the group consisting of hydrogen, alkylcarbonyl of from 2 to 19 carbon atoms, alkoxycarbonyl of from 2 to 5 carbon atoms, alkylcarbamoyl of from 2 to 5 carbon atoms and alkylsulfonyl of from 1 to 4 carbon atoms, or said moiety mono-, di- or trisubstituted in the alkyl or alkoxy group by fluorine, chlorine or bromine, or mono- or disubstituted in the alkyl or alkoxy group by alkoxy of from 1 to 4 carbon atoms or cyano, the di- or tri-substituents being the same or not at all the same; or is phenyl, phenylcarbonyl, phenycarbamoyl or phenysulfonyl, or phenyl, phenylcarbonyl, phenylcarbanoyl or phenylsulfonyl mono-, di- or trisubstituted in the phenyl moiety by fluorine, chlorine, bromine, alkyl of from 1 to 4 carbon atoms, alkoxy of from 1 to 4 carbon atoms, nitro, or cyano, the di- or tri-substituents being the same or not all the same;

Y is

hydrogen, cyano, or alkyl carboxylate of from 2 to 5 carbon atoms, phenyl, phenylsulfonyl or phenylcarboxylate, or phenyl, phenylsulfonyl or phenylcarboxylate mono-, di- or trisubstituted in the phenyl group by fluorine, chlorine or bromine, alkyl of from 1 to 4 carbon atoms or alkoxy of from 1 to 4 carbon atoms, or mono- or disubstituted in the phenyl group by nitro, amino, monoalkyl or dialkylamino wherein said alkyl is of from 1 to 4 carbon atoms, or monosubstituted in the phenyl group by methylenedioxy or benzoxazolyl, the di- or tri-substituents being the same or not at all the same, or is a moiety selected from the group consisting of thienyl, benzothienyl, furyl, benzofuryl, triazolyl, imidazolyl, benzimidazolyl, thiazolyl, benzothiazolyl, oxazolyl, benzoxazolyl, thiadiazolyl, oxadiazolyl or pyridyl, or said moiety mono-, di- or trisubstituted at one or more nuclear carbon atoms by fluorine, chlorine, bromine, alkyl of from 1 to 4 carbon atoms or alkoxy of from 1 to 4 carbon atoms, or mono- or disubstituted at one or more nuclear carbon atoms by nitro, phenyl, alkylphenyl wherein said alkyl is of from 1 to 4 carbon atoms, alkoxyphenyl wherein said

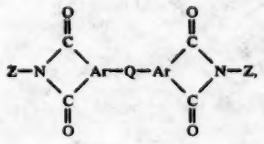
alkoxy is of from 1 to 4 carbon atoms, or cyano, or monosubstituted at a nuclear carbon atom by methylenedioxy or alkylcarboxylate of from 2 to 5 carbon atoms, the di- or trisubstituents being the same or not all the same; and Z is hydrogen, cyano or alkylcarboxylate of from 2 to 5 carbon atoms.

4,578,470
BIS-IMIDES CONTAINING HETEROCYCLIC AROMATIC RINGS

Jimmy L. Webb, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 20, 1983, Ser. No. 505,636
Int. Cl.[4] C07D *401/14*
U.S. Cl. 546—256 **9 Claims**

1. A bisimide having the formula

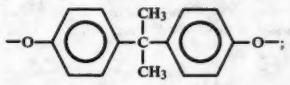


wherein:

Ar is a trivalent benzene or naphthalene radical having adjacent positions substituted by the carbonyl groups of the imide moiety;

Q is a single bond, $-CH_2-$, $-C_2H_4-$, $-C(CH_3)_2-$, $-O-$,

$-S_x-$, $-SO_2-$ or



Z is a highly electron-deficient heterocyclic group having a 5- or 6-membered ring and aromatic unsaturation and containing 1–3 hetero atoms of which at least one is nitrogen and the others, if present, are nitrogen or sulfur; and

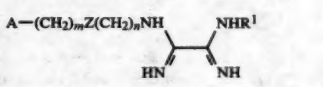
x is 1 or 2.

4,578,471
SUBSTITUTED AMINO ALKYL PYRIDYL ETHANEDIIMIDAMIDES

Ronnie R. Crenshaw, Dewitt, and Aldo A. Algieri, Fayetteville, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

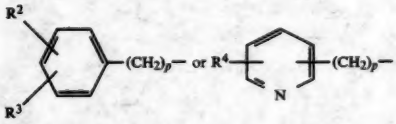
Division of Ser. No. 600,864, Apr. 16, 1984, Pat. No. 4,517,366, which is a division of Ser. No. 473,791, Mar. 16, 1983, Pat. No. 4,528,377, which is a continuation-in-part of Ser. No. 363,207, Mar. 29, 1982, abandoned. This application Dec. 3, 1984, Ser. No. 677,624
Int. Cl.[4] C07D *401/06*
U.S. Cl. 546—193 **5 Claims**

1. A compound of the formula



II

wherein R^1 is hydrogen, (lower)alkyl, 2-fluoroethyl, 2,2,2-trifluoroethyl, allyl, propargyl,



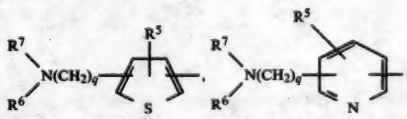
in which p is 1 or 2, R^2 and R^3 each are independently hydrogen, (lower)alkyl, (lower)alkoxy or halogen, and, when R^2 is hydrogen, R^3 also may be trifluoromethyl, or R^2 and R^3, taken together, may be methylenedioxy, and R^4 is hydrogen, (lower)alkyl or (lower)alkoxy;

m is an integer of from 0 to 2 inclusive;

n is an integer of from 2 to 5 inclusive;

Z is oxygen, sulfur or methylene; and

A is



in which R^5 is hydrogen, (lower)alkyl or (lower)alkoxy, q is an integer of from 1 to 4 inclusive and R^6 and R^7 each are independently (lower)alkyl, (lower)alkoxy(lower)alkyl in which the (lower)alkoxy moiety is at least two carbon atoms removed from the nitrogen atom, or phenyl(lower)alkyl, and, when R^6 is hydrogen, R^7 also may be cyclo(lower)alkyl, or R^6 and R^7, taken together with the nitrogen atom to which they are attached, may be pyrrolidino, methylpyrrolidino, dimethylpyrrolidino, morpholino, thiomorpholino, piperidino, methylpiperidino, dimethylpiperidino, N-methylpiperazino, 1,2,3,6-tetrahydropyridyl, homopiperidino, heptamethyleneimino, octamethyleneimino, 3-azabicyclo[3.2.2]non-3-yl or 3-pyrrolino; or a salt, hydrate or solvate thereof.

4,578,472
2,2,6,6-TETRAMETHYLPIPERIDINE AND ITS PRODUCTION

Masakatsu Yoshimura, Sakai; Takeo Fujii; Shinichi Yachigo, both of Toyonaka, and Tamaki Ishii, Suita, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

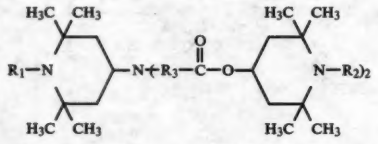
Filed May 15, 1984, Ser. No. 610,818

Claims priority, application Japan, May 27, 1983, 58-94467; Aug. 1, 1983, 58-141737

Int. Cl.[4] C07D *211/36*

U.S. Cl. 546—188 **18 Claims**

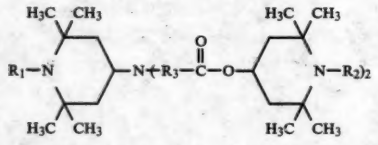
1. A 2,2,6,6-tetramethylpiperidine derivative represented by the formula (I),



(I)

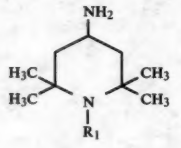
wherein R_1 and R_2 independently represent a hydrogen atom or methyl group, and R_3 represents an alkylene group having one to four carbon atoms.

7. A method for producing a 2,2,6,6-tetramethylpiperidine derivative represented by the formula (I),



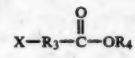
(I)

wherein R_1 and R_2 independently represent a hydrogen atom or methyl group, and R_3 represents an alkylene group having one to four carbon atoms, wherein a 4-amino-2,2,6,6-tetramethylpiperidine compound represented by the formula (II),



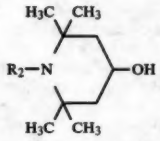
(II)

wherein R_1 has the same meaning as above, is reacted with a halogenated carboxylic acid or ester represented by the formula (III),



(III)

wherein X represents a halogen atom, R_3 has the same meaning as above, and R_4 represents a hydrogen atom or lower alkyl group, and then the resulting reaction product is reacted with a 4-hydroxy-2,2,6,6-tetramethylpiperidine compound represented by the formula (IV),



(IV)

wherein R_2 has the same meaning as above, in the presence of a basic catalyst, wherein the molar ratio of the compound of formula (II) to the acid of formula (III) is 1 to 2.5 and wherein the molar ratio of the compound of formula (IV) is 2 to 2.5 times amount of the compound of formula (II).

4,578,473
PROCESS FOR QUINOLINE-3-CARBOXYLIC ACID ANTIBACTERIAL AGENTS

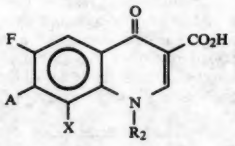
John M. Domagala, Canton, and Mel C. Schroeder, Ann Arbor, both of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Apr. 15, 1985, Ser. No. 723,019

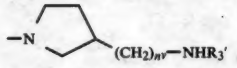
Int. Cl.[4] C07D *215/22*

U.S. Cl. 546—156 **21 Claims**

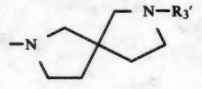
1. A process for the preparation of a compound of the formula



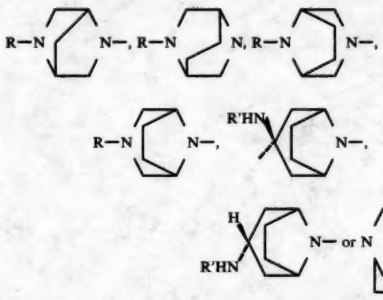
and pharmaceutically acceptable acid addition or base salts thereof, wherein A is, piperazino, N-methylpiperazino or a pyrrolidino group of the formula:



in which n' is zero or one and R_3' is hydrogen, methyl, ethyl, 1- or 2-propyl, a spiroamino group of the formula

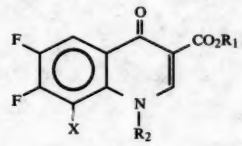


in which R_3' is hydrogen, methyl, ethyl or 1- or 2-propyl; or a bicyclic amino group of the formula



in which R is hydrogen, methyl, ethyl, 1- or 2-propyl, hydroxyethyl, benzyl, or p-aminobenzyl, and R′ is hydrogen or acetyl, X is hydrogen or fluorine, and R_2 is alkyl of one to three carbon atoms or cycloalkyl of three to six carbon atoms, which comprises:

(a) reacting 1.0–3.0 equivalent of an iodotrialkylsilane in an inert solvent with a compound of the formula



wherein R_2 and X are as defined above and R_1 is alkyl of one to three carbon atoms, and heating the reaction mixture until the reaction is complete at 30°–100° C. to form a trialkylsilyl ester thereof;

(b) adding at least one equivalent of the appropriate amine to the trialkylsilyl ester in an aprotic solvent or an aprotic co-solvent and heating the reaction mixture between 60° and 120° C. until the reaction is complete and, if desired, converting by known means the resulting compound of Formula I to a pharmaceutically acceptable acid addition salt thereof.

4,578,474

IMIDO, AMIDO AND AMINO DERIVATIVES OF MERCAPTOACYL PROLINES AND PIPECOLIC ACIDS

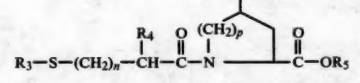
John Krapcho, Somerset, and Peter C. Wade, Pennington, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 454,936, Jan. 3, 1983, Pat. No. 4,497,953, which is a division of Ser. No. 268,921, Jun. 1, 1981, Pat. No. 4,390,695, which is a division of Ser. No. 162,341, Jun. 23, 1980, Pat. No. 4,310,461. This application Nov. 19, 1984, Ser. No. 672,977

Int. Cl.⁴ C07D *401/04, 403/04*

U.S. Cl. 546—188 **12 Claims**

1. A compound having the formula



wherein

R_1 and R_2 together with the nitrogen atom to which they are attached are 1-imidazolyl, 1-pyrrolidinyl-2,5-dione, 3-alkyl-1-pyrrolidinyl-2,5-dione, 3-aryl-1-pyrrolidinyl-2,5-dione, 1-piperidinyl-2,6-dione, 3-alkyl-1-piperidinyl-2,6-dione, 3-aryl-1-piperidinyl-2,6-dione, or 2,5-dihydro-2,5-dioxo-1H-pyrrol-1-yl;

R_3 is hydrogen, alkyl, aryl, arylalkyl, alkanoyl or arylcarbonyl;

R_4 is hydrogen, alkyl, alkylthio, or trifluoromethyl;

R_5 is hydrogen, alkyl or arylalkyl;

n is 0, 1 or 2; and

p is 1 or 2;

or a non-toxic, physiologically acceptable salt thereof, or symmetrical dimer thereof; wherein the term "aryl" refers to phenyl, 1-naphthyl, 2-naphthyl, or phenyl substituted with halogen, alkyl, alkoxy, alkylthio, hydroxy, alkanoyl, nitro, amino, dialkylamino, phenyl or trifluoromethyl groups; the term "alkanoyl" refers to groups having up to 9 carbon atoms; and the terms "alkyl" and "alkoxy" refer to groups having 1 to 8 carbon atoms.

4,578,475

NOVEL D-HOMOSTEROIDS

Andor Fürst, Basel; Marcel Müller, Frenkendorf, both of Switzerland; Ulrich Kerb, and Rudolf Wiechert, both of Berlin, Fed. Rep. of Germany, assignors to Hoffman-La Roche Inc., Nutley, N.J.

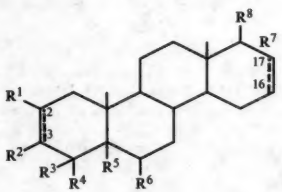
Filed Jan. 26, 1984, Ser. No. 573,983

Claims priority, application Switzerland, Feb. 11, 1983, 788/83

Int. Cl.⁴ C07D *211/70, 307/94*

U.S. Cl. 548—126 **8 Claims**

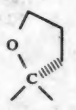
1. D-Homosteroids of the formula



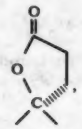
I

wherein R^1 represents a —CN, =NOH or =CH—NHOH group; R^2 represents oxo or, where R^1 represents a —CN group, R^2 represents oxo or a —OAc group; or R^1 and R^2 together with carbon atoms 2 and 3 of the steroid skeleton represent a [2,3-d]-fused isoxazole ring, a [3,2-c]-fused pyrazole ring, a [3,2-c]-fused N-acylated pyrazole ring or a [2,3-c]-fused furazan ring; Ac represents an acyl group: R^3 and R^4 represent methyl and R^5 and R^6 together represent an additional bond between carbon atoms 5 and 6 of the steroid skeleton; or R^4 and R^5 together represent —O—, R^3 represents hydrogen or methyl, and R^6 represents hydrogen; R^7 represents hydrogen, lower-alkyl or ethynyl; R^8 represents hydroxy or acyloxy; or R^7 and R^8 together represent a spiroether group of the formula

17a



or a spirolactone group of the formula



17a

the dotted 16,17-bond is an optional additional carbon-carbon bond; and the dotted 2,3-bond is an additional carbon-carbon bond when R^1 and R^2 together with carbon atoms 2 and 3 form the isoxazole or pyrazole ring or when R^2 represents a —OAc group.

4,578,476

PROCESS FOR THE PRODUCTION OF 2-ARYL-4-ACYL-1.3.4-OXDIAZOLONES-(5)

Manfred Schmidt, and Karl-Heinrich Meyer, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 18, 1984, Ser. No. 621,934

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1983, 3323283

Int. Cl.[4] C07D *271/10*; C08J *9/10*

U.S. Cl. 548—144 **3 Claims**

1. A process for the production of 2-aryl-4-acyl-1.3.4 oxdiazolones-(5) which comprises reacting an aromatic carboxylic acid hydrazide at a pH value of from 1.8 to 3.0 with phosgene in a mixture consisting of water and acetone as a solvent at a temperature of from 0° C. to 50° C., subsequently increasing the pH value to a range of 9.5 to 11.0 and adding about 100 mol % of a carboxylic acid chloride or about 50 mol % of a dicarboxylic acid chloride (based on 100 mol % of carboxylic acid hydrazide) and allowing the reaction to proceed to completion at from 0° C. to 50° C.

4,578,477

N-SUBSTITUTED BENZOTHIAZOLINE AND N-SUBSTITUTED BENZOXAZOLINE DERIVATIVES

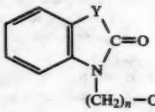
John J. D'Amico, Olivette, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 31, 1979, Ser. No. 108,915

Int. Cl.[4] C07D *263/58, 277/68*

U.S. Cl. 548—165 **2 Claims**

1. A compound of the formula



wherein Y is oxygen or sulfur; n is an integer of from 1 to 3; wherein R_1 is phenyl or phenyl substituted with from one to four substituents independently selected from the class consisting of lower alkyl, trifluoromethyl and halogen.

4,578,478

THIAZOLE DERIVATIVES AND PROCEDURE OF SYNTHESIS THEREOF

Tsuyoshi Tomiyama, Sakaki, Japan, assignor to Kotobuki Seiyaku Company Limited, Nagano, Japan

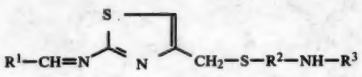
Filed Nov. 18, 1983, Ser. No. 553,183

Claims priority, application Japan, Dec. 3, 1982, 57-211290

Int. Cl.[4] C07D *277/42*

U.S. Cl. 548—193 **11 Claims**

1. A compound of the formula



wherein

R^1 is a di-lower alkylamino group,

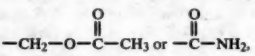
R^2 is a lower alkylene group,

R^3 is

wherein

A represents =N—CN or =O and

B represents —NH—D,



wherein D is a lower alkyl or cyclohexyl group, and pharmaceutically acceptable acid addition salts thereof.

4,578,479

PROCESS FOR PREPARING 1,2,4-TRIAZOLE-3-CARBOXAMIDES

Kiyoshi Fukui; Noboru Kakeya, and Mitsushi Taguchi, all of Ichihara, Japan, assignors to Ube Industries, Ltd., Ube, Japan

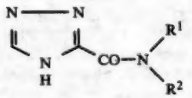
Filed Apr. 13, 1984, Ser. No. 600,307

Claims priority, application Japan, Apr. 26, 1983, 58-72066

Int. Cl.[4] C07D *249/14, 401/06, 403/06, 413/06*

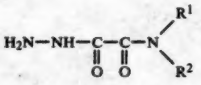
U.S. Cl. 548—269 **15 Claims**

1. A process for preparing a 1,2,4-triazole-3-carboxamide represented by the formula:



wherein, R^1 and R^2 represent independently a hydrogen atom, an alkyl group having 1 to 10 carbon atoms, a cycloalkyl group having 5 to 7 carbon atoms or an aryl group having 6 to 10 carbon atoms or both R^1 and R^2 represent an alkylene group having 2 to 6 carbon atoms linked with each other directly or through an oxygen atom or a nitrogen atom to form a ring together with the nitrogen atom to which they are attached,

which comprises subjecting an oxamohydrazide represented by the formula:



wherein R^1 and R^2 have the same meanings as defined above, to reaction with a water soluble salt of formamidine.

4,578,480
PROCESS FOR PREPARING 1-(3-BROMO-2-ALKYLPROPANOYL)-L-PROLINE DERIVATIVES

Roger Crossley, Reading, England, assignor to John Wyeth & Brother Limited, Maidenhead, England

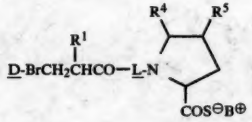
Division of Ser. No. 236,350, Feb. 20, 1981, Pat. No. 4,349,480. This application May 10, 1982, Ser. No. 376,354

Claims priority, application United Kingdom, Feb. 26, 1980, 8006414

Int. Cl.[4] C07D *207/12, 209/12*

U.S. Cl. 548—533 4 Claims

1. A compound of formula XIII



(XIII)

substantially free of the L,L isomer, wherein R^1 is lower alkyl, R^4 and R^5 are either both hydrogen or together with the carbon atoms to which they are attached represent a fused benzene ring optionally substituted by a group selected from hydroxy, lower alkyl, lower alkoxy and halogen and $B^{\oplus}$ is an alkali metal cation or a quaternary ammonium ion.

4,578,481
PYRROLACETIC AMIDES HAVING ANTIINFLAMMATORY ACTIVITY

Alessandro Baglioni, Rome, Italy, assignor to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A., Rome and Medosan Industrie Biochimie Riunite S.p.A., Albano Laziale, both of, Italy

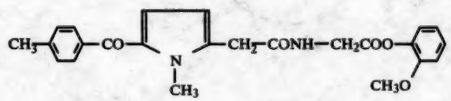
Division of Ser. No. 700,059, Feb. 11, 1985, which is a division of Ser. No. 467,308, Feb. 17, 1983, abandoned. This application Apr. 30, 1985, Ser. No. 728,758

Claims priority, application Italy, Feb. 26, 1982, 47881 A/82

Int. Cl.[4] C07D *207/323*

U.S. Cl. 548—539 1 Claim

1. A compound having the formula



4,578,482
PROCESS FOR PREPARING PROSTACYCLINS

Ryoji Noyori; Masaaki Suzuki; Akira Yanagisawa, all of Aichi, and Seizi Kurozumi, Tokyo, all of Japan, assignors to Teijin Limited, Osaka, Japan

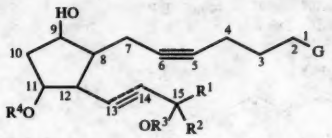
Filed Dec. 21, 1983, Ser. No. 563,835

Claims priority, application Japan, Dec. 23, 1982, 57-224878; Dec. 28, 1982, 57-227332

Int. Cl.[4] C07D *307/935*

U.S. Cl. 549—214 13 Claims

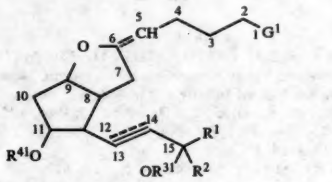
1. A process for the preparation of a prostacyclin comprising the reaction of a 5,6-dehydroprostaglandin F_2 expressed by the following formula (I)



(I)

wherein the symbol ≡≡≡ between the 13- and 14-positions indicates that a double or triple bond exists between the 13- and 14-positions; G represents —COOR[5] or —CONR[6]R[7] in which R^5 represents a C_1–C_{10} alkyl group, a substituted or unsubstituted phenyl group, a substituted or unsubstituted alicyclic group, a substituted or unsubstituted phenyl (C_1–C_2) alkyl group or a tri(C_1–C_7)hydrocarbonsilyl group, R^6 and R^7 are identical or different and each represents a C_1–C_{10} alkyl group, taken together with a nitrogen atom to which they are bonded may form a substituted or unsubstituted 5- or 6-membered ring which may include a hetero atom; R^1 represents a hydrogen atom, a methyl group, or a protected ethynyl group; R^2 represents an unsubstituted C_5–C_8 alkyl group, a C_1–C_5 alkyl group substituted by a substituent selected from phenyl, phenoxy, C_1–C_6 alkoxy and C_5–C_6 cycloalkyl, which substituent may be substituted, or a substituted or unsubstituted alicyclic group; R^3 and R^4 are identical or different and each represents a C_2–C_7 acyl group, a tri(C_1–C_7)hydrocarbon-silyl group or a group forming an acetal linkage together with the oxygen atom of the hydroxyl group,

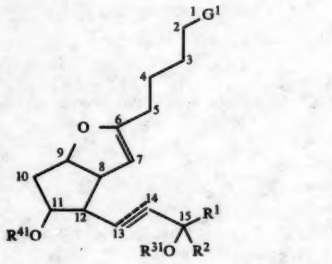
with a mercury (II) compound in an inert organic solvent in the presence of tri(C_1–C_6)alkylamine, the treatment of the reaction product with a boron hydride compound, and, if necessary, deprotecting reaction, hydrolysis reaction, or salt-forming reaction, to prepare a prostacyclin expressed by the following formula (II)



(II)

wherein the symbol ≡≡≡ between the 13- and 14-positions, R^1 and R^2 are as defined above; G^1 is as same as G or represents a carboxyl group or its salt; R^{31} and R^{41} are respectively as same as R^3, R^4 or represent a hydrogen atom.

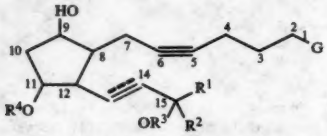
13. A process for the preparation of Δ^6-prostaglandins I_1 expressed by the following formula (IV)



(IV)

wherein the symbol ≡≡≡, G^1, R^1, R^2, R^{31} and

R^{41} are as defined in claim 1,
comprising allowing a 5,6-dehydroprostaglandin F_2 expressed by the following formula (I)



(I)

wherein the symbol ═══, G, R^1, R^2, R^3 and R^4 are as defined in claim 1,
to react with a mercury (II) compound in an inert organic solvent in the absence of tri(C_1–C_6)alkylamine, treating with the reaction product with a boron hydride compound, and, if necessary, further subjecting the reaction product to the deprotecting reaction, hydrolysis reaction, or salt-forming reaction.

4,578,483

GIBBERELLIN AMINE SALTS

Richard P. Mabelis, Cheshire, England, assignor to Imperial Chemical Industries Plc, London, England

Filed Nov. 7, 1983, Ser. No. 549,444

Claims priority, application United Kingdom, Dec. 1, 1982, 8234274

Int. Cl.[4] C07D *307/00*

U.S. Cl. 549—297 **4 Claims**

1. A mixture of salts of gibberellin A_4 (GA_4) and of gibberellin A_7 (GA_7) with an amine of the formula $R^1CH_2NHR^2$, wherein R^1 is a phenyl, thienyl or pyridyl radical unsubstituted or substituted with chlorine or C_1–C_4 alkyl, and R^2 is a straight chain alkyl or alkynyl radical of up to 3 carbon atoms.

4,578,484

PROCESS FOR THE PREPARATION OF LINEATIN

Lars Skatteböl, and Yngve Stenström, both of Oslo, Norway, assignors to Borregaard Industries Limited, Norway

PCT No. PCT/NO84/00013, § 371 Date Nov. 15, 1984, § 102(e) Date Nov. 15, 1984, PCT Pub. No. WO84/03703, PCT Pub. Date Sep. 27, 1984

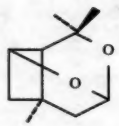
PCT Filed Feb. 27, 1984, Ser. No. 674,629

Claims priority, application Norway, Mar. 15, 1983, 830902

Int. Cl.[4] C07D *319/04, 323/04*

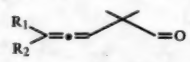
U.S. Cl. 549—360 **4 Claims**

1. Process for the preparation of lineatin (3,3,7-trimethyl-2,9-dioxatricyclo[3,3,1,$0^{4,7}$]nonane) of the formula



7

characterized in that
(i) a 2,2-dimethyl-3,4-pentadienal of the formula



1

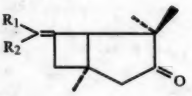
in which R_1 and R_2 each is hydrogen or lower alkyl, is reacted with β-methylallyl magnesiumhalide,
(ii) the formed 2,5,5-trimethylocta-1,6,7-trien-4-ol derivative of the formula

2

is subjected to oxidation which does not attack the double bonds,
(iii) the formed 2,5,5-trimethylocta-1,6,7-trien-4-one derivative of the formula

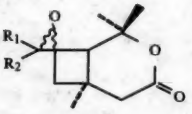
3

is subjected to pyrolysis,
(iv) the formed 1,4,4-trimethyl-6-methylene-bicyclo[3,2,0]-heptan-3-one derivative of the formula



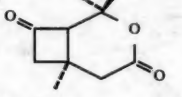
4

is subjected to oxidation with an organic peracid,
(v) the resulting 5,5,9-trimethyl-2,6-dioxa-7-oxobicyclo[4,2,-0]octylspiro[2,7]decane derivative of the formula



5

is subjected to oxidation with a periodate in acidic medium,
(vi) the resulting 1,5,5-trimethyl-4-oxabicyclo[4,2,0]-octan-3,7-dione of the formula



6

is reduced to lineatin.

4,578,485

SYNTHESIS OF SPECTINOMYCIN ANALOGS BY AN IMPROVED GRIGNARD PROCESS

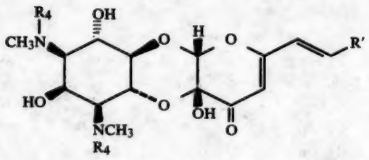
David R. White, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Feb. 8, 1984, Ser. No. 577,641

Int. Cl.[4] C07D *323/04*

U.S. Cl. 549—361 **12 Claims**

1. A compound having the formula

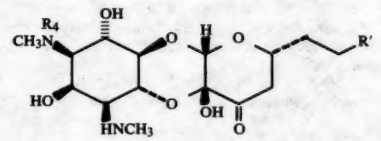


IIb

wherein R_4 is hydrogen or a blocking group; and

R′ is alkyl of from 1 to 18 carbon atoms, inclusive, with the proviso that when R_4 is hydrogen, R′ is alkyl of from 7 to 18 carbon atoms, inclusive.

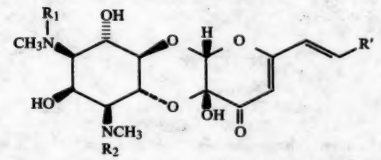
3. A process for preparing a compound having the formula



III

wherein R′ is alkyl of from 1 to 18 carbon atoms, inclusive; and R_4 is hydrogen or a blocking group; which comprises

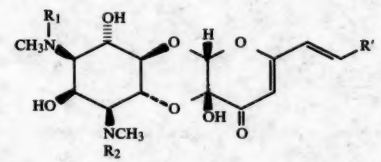
(1) hydrogenating in the presence of a palladium catalyst a compound having the formula



II

wherein R_1 and R_2 are blocking groups; and R′ is as defined above to obtain the compound III with the proviso that R_4 is hydrogen if the blocking groups, R_1 and R_2 are removed by the hydrogenation and R_4 is a blocking group if the blocking groups R_1 and R_2 are not removed by the hydrogenation; or which comprises

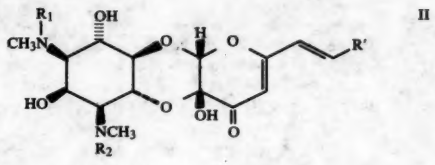
(2) hydrogenating in the presence of a palladium catalyst a compound having the formula



II

wherein R_1, R_2 and R′ are as defined above with the proviso that R_1 and R_2 are blocking groups that are not removed by the hydrogenatior ınd removing the blocking groups to obtain the compound III wherein R_4 is hydrogen.

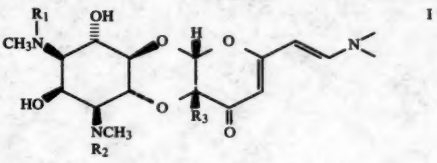
6. A process for preparing a compound having the formula



II

wherein R_1 and R_2 are the same and are a blocking group; and R′ is alkyl of from 1 to 18 carbon atoms, inclusive; which comprises

(a) stirring an enamine having the formula



I

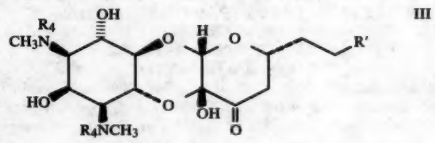
wherein R_1 and R_2 are as defined above; and R_3 is acyl;

with a silylating reagent;

(b) treating the product of step (a) with a compound having the formula R′ MgHal wherein Hal is bromo, chloro and iodo and R′ is as defined above; and

(c) adding a compound to remove the silicon containing protective group of the product of step (a) to obtain the compound II.

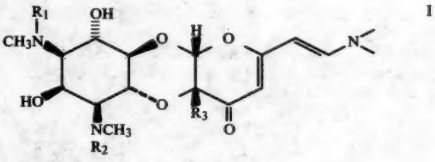
10. A process for preparing a compound having the formula



III

wherein R′ is alkyl of from 1 to 18 carbon atoms, inclusive; and R_4 is hydrogen or a blocking group which comprises

(a) stirring an enamine having the formula



I

wherein R_1 and R_2 are the same and are a blocking group; and R_3 is acyl;

with a silylating agent;

(b) treating the product of step (a) with a compound having the formula R′ MgHal wherein R′ is as defined above;

(c) adding a compound to remove the silicon containing protective group of the product of step (a); and

(1) hydrogenating the compound of step (c) to obtain the compound III with the proviso that R_4 is hydrogen if the blocking groups R_1 and R_2 are removed by the hydrogenation and R_4 is a blocking group if the

blocking groups R_1 and R_2 are not removed by the hydrogenation; or

(2) hydrogenating the compound of step (c) to obtain the compound III with the proviso that R_1 and R_2 blocking groups that are not removed by the hydrogenation and removing the blocking groups to obtain the compound III wherein R_4 is hydrogen.

4,578,486

SMOKING COMPOSITIONS CONTAINING A DICARBONATE ESTER FLAVORANT-RELEASE ADDITIVE

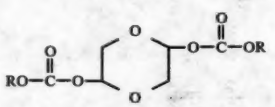
Kenneth F. Podraza, Richmond, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Division of Ser. No. 603,035, Apr. 23, 1984, Pat. No. 4,532,944. This application Jun. 24, 1985, Ser. No. 748,371

Int. Cl.⁴ C07D *23/06*

U.S. Cl. 549—379 **4 Claims**

1. A dioxane compound corresponding to the formula:



where R is a substituent selected from aliphatic, alicyclic and aromatic radicals.

4,578,487

BINDING AGENTS CONTAINING TITANIC ACID ESTERS FOR THE PREPARATION OF COATING COMPOSITIONS AND REFRACTORY BODIES, AND A METHOD FOR THE PREPARATION OF THESE BINDING AGENTS

Dieter Barfurth, Troisdorf, and Heinz Nestler, Troisdorf-Eschmar, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Jan. 26, 1983, Ser. No. 461,072

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1982, 3203546

Int. Cl.⁴ C07F *7/28*

U.S. Cl. 556—40 **14 Claims**

1. An improved binding agent based on titanium compounds for slips of refractory material, wherein the improvement comprising the titanium compound being in the form of an hydrous liquid chelated polymeric titanic acid ester, said ester being chelated with 0.2 to 1 gram molecule of chelating agent per gram atom of titanium.

4,578,488

BISALKYL BIS(TRIALKANOL AMINE)ZIRCONATES AND USE OF SAME AS THICKENING AGENTS FOR AQUEOUS POLYSACCHARIDE SOLUTIONS

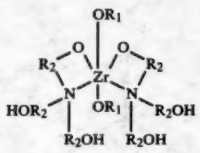
Gregory J. Rummo, Bronxville, and Robert Startup, Bloomingburg, both of N.Y., assignors to Kay-Fries, Inc., Stony Point, N.Y.

Continuation of Ser. No. 371,022, Apr. 22, 1982, abandoned. This application Jan. 10, 1985, Ser. No. 690,384

Int. Cl.⁴ C07F *7/00, 7/28*

U.S. Cl. 556—56 **10 Claims**

1. A method for the preparation of a reaction product comprising a compound having the formula



where R_1 and R^2 are individually selected from the group consisting of alkyl having from 1 to 8 carbon atoms, said method comprising the steps of admixing at least one tetraalkyl zirconate, of the form $Zr(OR_1)_4$, and at least one trialkanol amine, of the form $N(R_2OH)_3$, allowing the resultant reaction to proceed in the absence of applied heat and adding water to said reaction product in order to stabilize said reaction product in liquid form.

4,578,489

AMMONIUM STANNATES-(IV)

Wolfgang Wehner, Zwingenberg, and Reinhardt Grade, Bensheim, both of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 26, 1983, Ser. No. 535,487

Claims priority, application Switzerland, Jun. 10, 1982, 5876/82

Int. Cl.⁴ C07F *7/22*

U.S. Cl. 556—100 **6 Claims**

1. A compound of formula Ia

$$[(R^1)_a(R^2)_bN(R^3)_c(R^4)_d]_n^{\oplus}[(R^7)_3SnX_rY_t]^{n\ominus} \quad \text{(Ia)}$$

in which R^1 and R^2 are methyl, R^3 is benzyl, R^4 is C_8–C_{16}-alkyl, R^7 is C_3–C_5-alkyl, X and Y independently of one another are fluorine, chlorine or bromine, and a, b, c and d are l, n is l, r and t are an interger from 0 to 2, the total (r+t) having the value (n+l).

4,578,490

IONIC BIS(DICARBOXYLATO)PALLADATE(II) ANTI-TUMOR AGENTS

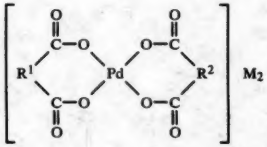
Alan R. Amundsen, Somerville, and Eric W. Stern, Mountainside, both of N.J., assignors to Engelhard Corporation, Iselin, N.J.

Continuation of Ser. No. 392,817, Jun. 28, 1982, abandoned. This application Aug. 17, 1984, Ser. No. 642,235

Int. Cl.⁴ C07F *15/00*

U.S. Cl. 556—136 **3 Claims**

1. A palladium(II) compound of the formula:



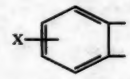
wherein

R^1 and R^2 are the same or different and represent the following:

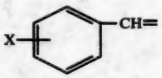
(a) methylene or ethylene with the proviso that R^1 and R^2 cannot both represent methylene at the same time;

(b) cycloalkylene of the formula:

wherein n is an integer having a value of 2–3;
(c) alkildene of 2–4 carbon atoms;
(d) cycloalkylidene containing 4–6 nuclear carbon atoms;
(e) o-phenylene of the formula:



wherein X is selected from the group consisting of hydrogen, halogen and C_{1-6} alkyl;
(f) aralkylidene of the formula:



(g) substituted methylidene of the formula: $=CR^3R^4$ wherein R^3 and R^4 are selected from the group consisting of hydrogen, halogen and hydroxy, with the proviso that R^3 and R^4 cannot both represent hydrogen at the same time; or
(h) keto; and
M is an alkali metal or M_2 is an alkaline earth metal.

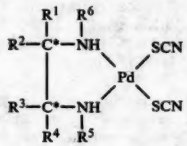
4,578,491

BIS(THIOCYANATO)PALLADIUM(II) COMPLEXES

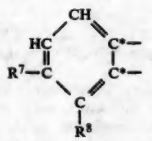
Alan R. Amundsen, Somerville, and Eric W. Stern, Mountainside, both of N.J., assignors to Engelhard Corporation, Iselin, N.J.

Continuation of Ser. No. 392,816, Jun. 28, 1982, abandoned. This application Aug. 20, 1984, Ser. No. 642,315
Int. Cl.[4] C07F *15/00*
U.S. Cl. 556—137 **8 Claims**

1. A compound of the formula:



wherein
R^1 and R^4 are selected from the group consisting of hydrogen and C_{1-6} alkyl;
R^2 and R^3 are selected from the group consisting of hydrogen, C_{1-6} alkyl, hydroxymethyl or, taken together, R^2 and R^3 represent C_{2-6} alkylene;
R^1–R^4, taken together with the carbon atoms to which they are attached, represent naphtylene or a phenylene of the formula:



wherein
R^7 and R^8 represent hydrogen, C_{1-6} alkyl, hydroxy or carboxy; and
R^5 and R^6 are selected from the group consisting of hydrogen, C_{1-6} alkyl, hydroxymethyl or carboxymethyl.

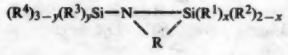
4,578,492

NON-CORROSIVE SILICONE RTV COMPOSITIONS

Sandra L. Pratt, Clifton Park; Gary M. Lucas, Scotia, both of N.Y., and Michio Zembayashi, Ohta, Japan, assignors to General Electric Company, Waterford, N.Y.

Division of Ser. No. 542,222, Oct. 14, 1983, Pat. No. 4,499,234. This application Aug. 10, 1984, Ser. No. 640,073
Int. Cl.[4] C07F *7/10*
U.S. Cl. 556—407 **14 Claims**

1. A novel compound of the formula



where R is a substituted or unsubstituted organo group having at least two carbon atoms, R^1 is a hydrolyzable leaving group selected from the group consisting of alkoxy, amido, amino, carbamato, enoxy, imidato, isocyanato, oximato, thioisocyanato and ureido, R^2 and R^3 are independently selected C_{1-13} monovalent substituted or unsubstituted hydrocarbon radicals, R^4 is a hydrolyzable leaving group selected from the group consisting of alkoxy, amido, amino, carbamato, enoxy, imidato, isocyanato, oximato, thioisocyanato and ureido; x is equal to 1 or 2 and y is equal to 0 to 2 inclusive.

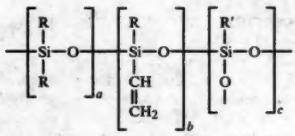
4,578,493

VINYL-HYDRO POLYSILOXANE COPOLYMERS RELEASE COMPOSITIONS

Mike S. H. Chang, Danbury, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Feb. 11, 1983, Ser. No. 465,731
Int. Cl.[4] C07F *7/08*; C08F *2/46, 2/50, 30/08*
U.S. Cl. 556—451 **11 Claims**

1. Liquid vinyl-hydro polysiloxane copolymer having the moiety structure:



wherein a, b and c are numbers larger than 0: the molar ratio of a to b is selected from a range of about 1 to 99 to 99 to 1, the percent by mole of c to a is selected from a range of about 0.01% to about 10%, R's are the same or different monovalent hydrocarbon radicals selected from the group of C_1 to C_4 alkyl, cyclohexyl and phenyl groups and R' is an R group or an oxygen radical.

4,578,494

PREPARATION OF POLYSILOXANES FROM HALOSILANES

Ollie W. Marko; Robert D. Steinmeyer, both of Carrollton, Ky., and Stefan Rentsch, Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Jun. 14, 1985, Ser. No. 744,708
Int. Cl.[4] C07F *7/08, 7/18*
U.S. Cl. 556—452 **30 Claims**

1. A method for producing polysiloxanes, said method comprising (1) reacting a halosilane or mixture of halosilanes in the presence of a metal oxide or mixture of metal oxides and sulfolane wherein polysiloxanes are formed from said halosilane or mixture of halosilanes and wherein said metal oxide or mixture of metal oxides forms a metal halogen complex or mixed metal halogen complex with said sulfolane and (2) thereafter separating the polysiloxanes.

4,578,495

PREPARATION OF ORGANOSILANES/ORGANOPOLYSILANES FROM DISILANES

Gerard Soula, Meyzieu, and Christian Simonnet, Venissieux, both of France, assignors to Rhone-Poulenc Specialties Chimiques, Courbevoie, France

Filed May 30, 1985, Ser. No. 739,109

Claims priority, application France, May 30, 1984, 8408511

Int. Cl.[4] C07F *7/08*

U.S. Cl. 556—468 **20 Claims**

1. A process for the preparation of organosilane/polysilane, comprising comprising contacting, in an inert atmosphere, (1) at least one disilane having the general formula:

$$(R)_3-Si-Si-(R)_3 \qquad (I)$$

wherein the radicals R, which may be identical or different, are each C_1-C_6 alkyl, hydrogen, 3,3,3-trifluoropropyl, trimethylsiloxy, fluorine, chlorine, bromine or iodine, with (2) a catalytically effective amount of a catalyst system comprising (a) at least one ionic inorganic salt having the formula:

$$M^+A^-$$

wherein M^+ is lithium, sodium, potassium, rubidium or cesium, and A^- is fluoride, chloride, bromide or iodide, and (b) at least one compound which complexes the cation M^+ of said salt (a).

4,578,496

POLYMERIC METAL-AMINE COMPLEX COMPOUNDS, PROCESSES FOR THEIR PREPARATION AND USE

Peter Panster, Rodenbach, and Peter Kleinschmit, Hanau, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Division of Ser. No. 404,115, Aug. 2, 1982, Pat. No. 4,424,332. This application Oct. 20, 1983, Ser. No. 543,720

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1981, 3131954

Int. Cl.[4] C07F *7/08*; C07C *69/02, 45/00, 5/02*

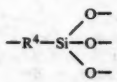
U.S. Cl. 556—479 **11 Claims**

1. A process for a catalytic reaction to achieve hydroformylation, hydrogenation or, hydrosilylation, which comprises carrying out said reaction in the presence of a catalyst which is a polymeric complex organosiloxane-amine of a member selected from the group consisting of molybdenum, tungsten, manganese, rhenium and a metal of the sub-groups VIII and I of the Periodic Table, wherein at least one amine of the formula:

(1)

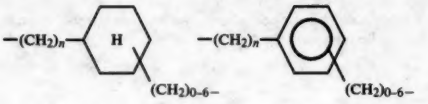
is bonded coordinately to each central metal atom, the metal:-nitrogen atomic ratio is from 1:1 to $1:10^6$, any coordination points at the metal atom which are still free are occupied by other electron pair donors, and the required charge compensation is effected by means of an inorganic or organic anion,

and in the formula (1) R^1 and R^2 represent a group of the formula



(2)

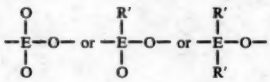
R^4 denotes a linear or branched alkylene group having 1 to 10 C atoms or a cycloalkylene group having 5 to 8 C atoms, or represents the units:



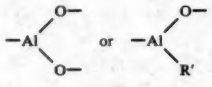
wherein n is 1 to 6 methylene groups linked to a nitrogen atom,

R^1 and R^2 can be identical or different,

and the free valences of the oxygen atoms are saturated either by silicon atoms of further groups of the formula (2) and/or by crosslinking bridge members of the formula:



wherein E represents silicon, titanium or zirconium, or by the units:



wherein R' is a methyl or ethyl group and the ratio of the silicon atoms in (2) to the bridge atoms silicon, titanium, zirconium and aluminum can be from 1:0 to 1:10,

R^3 has the same meaning as R^1 and R^2, or represents hydrogen, a linear or branched alkyl group having 1 to 10 C atoms or a cycloalkyl group having 5 to 8 C atoms or the benzyl group.

4,578,497

TETRAALKYLSILANE SYNTHETIC FLUIDS

Anatoli Onopchenko, Monroeville, and Edward T. Sabourin, Allison Park, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Nov. 30, 1984, Ser. No. 677,047

Int. Cl.[4] C07F *7/08*

U.S. Cl. 556—479 **28 Claims**

1. A process for the production of tetraalkylsiiane compounds which comprises contacting an admixture comprising

(A) at leaast one alkylsilane selected from the group consisting of

(i) a monoalkylsilane having the formula

$$R-Si-H_3,$$

(ii) a dialkylsilane having the formula

$$R-SiH_2-R_1,$$

(iii) a trialkylsilane having the formula

$$R-SiH-(R_1)_2,$$

and mixtures thereof, wherein R and R_1 each represent an alkyl radical of from one to 20 carbon atoms per molecule, and

(B) at least one alpha olefin containing from two to about 20 carbon atoms per molecule, under an inert atmosphere with an oxygenated, platinum-containing catalyst selected from the group consisting of (i) a platinum catalyst having a basicity substantially equal to or less than that provided by a platinum-containing catalyst having a triphenylphosphine ligand, or (ii) a heterogeneous platinum-containing catalyst, under hydrosilylation conditions, said platinum-containing catalyst having been contacted with an oxy-

gen-containing gas to render it active for the hydrosilylation process.

4,578,498

PHENYLETHYLENE DERIVATIVES AND THEIR USE AS DRUGS

Fritz-Frieder Frickel, Deidesheim, and Axel Nuerrenbach, Gruenstadt, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

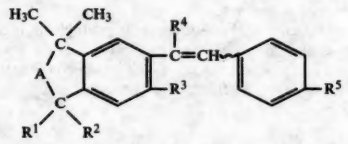
Continuation-in-part of Ser. No. 457,182, Jan. 11, 1983, abandoned. This application Jul. 20, 1983, Ser. No. 515,465

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1982, 3202100

Int. Cl.⁴ C07C *69/76*

U.S. Cl. 560—8 **11 Claims**

1. A phenylethylene derivative of the formula



I

where A is C_1–C_2-alkylene which is unsubstituted or substituted by methyl, R^1 is hydrogen or methyl, R^2 is hydrogen or methyl, R^3 is C_1–C_8-alkyl, R^4 is hydrogen or C_1–C_4-alkyl and R^5 is carboxyl or C_2–C_4-carbalkoxy, and, where relevant, its salts with physiologically tolerated bases.

4,578,499

OXALIC ACID ESTER DERIVATIVES

Kazuhiro Imai; Hiroshi Ogata; Motoaki Tanaka, all of Tokyo; Hiroyoshi Nawa, and Masami Ishihara, both of Saitama, all of Japan, assignors to Wako Pure Chemical Industries Ltd., Osaka, Japan

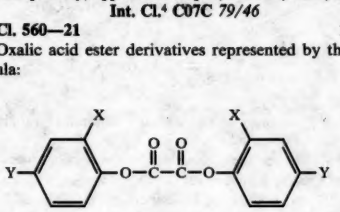
Filed Jun. 27, 1985, Ser. No. 749,428

Claims priority, application Japan, Jun. 30, 1984, 59-136060

Int. Cl.⁴ C07C *79/46*

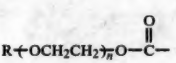
U.S. Cl. 560—21 **11 Claims**

1. Oxalic acid ester derivatives represented by the general formula:



(I)

wherein either one of X and Y represents a nitro group, and the other represents



in which R represents a lower alkyl group, and n represents a figure of 1–50.

4,578,500

POLYAMINES AND A PROCESS FOR THEIR PRODUCTION

Werner Rasshofer, Cologne, and Gerhard Ballé , Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 21, 1983, Ser. No. 553,722

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1982, 3244912

Int. Cl.⁴ C07C *87/50, 125/06, 85/20*

U.S. Cl. 560—25 **12 Claims**

1. A process for the production of compounds containing aromatic amino groups by

(a) hydrolyzing

(i) a compound containing at least two aromatically bound isocyanate groups and having an isocyanate content of from 0.5 to 40 wt % mixed with

(ii) water in at least a stoichiometric amount and

(iii) a solvent or solvent mixture containing

(A) 50–100 wt. % solvent containing only carbon-carbon, carbon-hydrogen, ether and/or thioether bonds and

(B) 0–50 wt. % solvent which is at least partly water-soluble

at −20° to +185° C. in the absence of an acidic or basic catalyst and

(b) isolating the product amine.

4,578,501

PREPARATION OF TEREPHTHALIC ACID FROM A CRUDE DIMETHYL TEREPHTHALATE

Anton Schoengen, Witten; Georg Schreiber, Cologne, and Heinz Schroeder, Dortmund-Syburg, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 79,253, Sep. 27, 1979, Pat. No. 4,302,595. This application Apr. 18, 1980, Ser. No. 141,572

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1979, 2916197; Mar. 27, 1980, 3011858

Int. Cl.⁴ C07C *67/39, 51/09;* B01D *3/14, 9/02*

U.S. Cl. 560—77 **4 Claims**

1. A process for the production of fiber grade terephthalic acid from dimethyl terephthalate as the intermediate product by oxidation of p-xylene and/or methyl p-toluate with oxygen-containing gases in the presence of heavy-metal-containing oxidation catalysts at elevated temperature and elevated pressure, by esterification of the oxidation mixture with methanol at elevated temperature and elevated pressure, and by distillatory separation of the crude ester into a methyl p-toluate-rich fraction recycled into the oxidation and a residual fraction, as well as into a crude dimethyl terephthalate having a limited content of oxidation intermediates and other by-products, by continuous hydrolysis of the crude dimethyl terephthalate with water at a mass ratio of crude dimethyl terephthalate to water of between 3:1 and 0.1:1 and at temperatures of between 350° C. and 140° C. and at the pressure required to maintain the liquid phase to produce a reaction mixture containing crystalline fiber grade terephthalic acid, by recrystallization of the terephthalic acid at temperatures of between 300° C. and 150° C., replacement of the mother liquor by demineralized water, and obtaining the terephthalic acid from the reaction mixture, two-stage conductance of the hydrolysis being effected by:

(a) separation of the reaction mixture after the first hydrolysis stage into a thickened suspension of solid terephthalic acid and mother liquor and a liquid phase containing the residual mother liquor,

(b) continuous dilution and quantitative replacement of the mother liquor in the suspension by demineralized water conducted counter-currently to the crystallized terephthalic acid in the second hydrolysis state,

(c) single- or multi-stage expansion of the thus-obtained suspension of demineralized water and terephthalic acid

and obtaining of the terephthalic acid by means of a solid-liquid separating operation,

(d) cooling of the combined mother liquors according to stages (a) and (b) to such an extent that still dissolved terephthalic acid, as well as by-products, are precipitated separately or together thereby separating as solid substances; the distillatory separation of the crude ester being effected by vacuum distillation at elevated temperature in a three-column series-arranged distillation system wherein the crude ester is separated into a methyl p-toluate-rich fraction as head product of a methyl p-toluate first column, into a fraction rich in methyl ester of terephthalaldehydic acid as head product of the second column for distilling the terephthalaldehydic acid ester as well as a purified crude dimethyl terephthalate fraction with a methyl ester of terephthalaldehydic acid content of 0.01–0.1% by weight as head product and a residual fraction as the sump product of a crude dimethyl terephthalate third column.

4,578,502

POLYETHYLENE TEREPHTHALATE SAPONIFICATION PROCESS

Warner J. G. Cudmore, 25847 Ashwood Dr., Sun Lakes, Ariz. 85224

Filed Jan. 22, 1985, Ser. No. 693,248
Int. Cl.[4] C07C *67/60, 51/487*
U.S. Cl. 560—79 **22 Claims**

1. A process for recovering monomeric phthalic polycarboxylic acids or dimethyl ester thereof and low molecular weight polyols from solid scrap high molecular weight polyalkylene phthalate polyester resins comprising:

granulating said scrap resin into resin particles sufficiently minute to be readily slurried;

slurrying said granulated scrap resin particles with sufficient solvent to prepare a readily pumpable slurry, said solvent selected from the class consisting of water and methanol in which a low molecular weight polyol is soluble;

depolymerizing said slurried resin at a temperature, pressure and for a time sufficient to convert substantially all of said resin into its monomeric components in liquid form in a hydrolized or methanolized mixture; and

crystallizing substantially all of the monomeric polycarboxylic acid monomer present in said hydrolized or methanolized mixture by flash crystallizing said mixture.

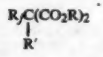
4,578,503

ALKYLATED OR ALKENYLATED MALONIC ACID OR ITS DERIVATIVES HAVING A FLUORINE

Nobuo Ishikawa; Takeshi Nakai, both of Yokohama, and Yoshio Inouye, Machida, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed Aug. 31, 1983, Ser. No. 528,134
Claims priority, application Japan, Aug. 31, 1982, 57-151007; Aug. 31, 1982, 57-151008
Int. Cl.[4] C07C *67/317, 69/612, 57/36*
U.S. Cl. 560—82 **9 Claims**

1. An alkylated or alkenlated malonic acid or its acid salts and esters having a fluorine containing aliphatic substitutent, as expressed by the following formula:



where R_f is a fluorine containing aliphatic group, R is an aliphatic group, or hydrogen or alkali metal atom, and R′ is an aryl substituted aliphatic group.

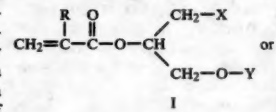
4,578,504

ACRYLATE AND METHACRYLATE MONOMERS AND POLYMERS

W. James Hammar, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 3, 1983, Ser. No. 500,782
Int. Cl.[4] C07C *69/78, 69/653, 143/68;* C07F *7/08*
U.S. Cl. 560—112 **12 Claims**

1. A monomer having the formulae:



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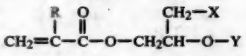


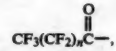
II

wherein

R is hydrogen or methyl;

X is fluoro, chloro, bromo, iodo, perfluoroalkylsulfonoxy of one to three carbon atoms, perfluoroacyloxy of one to three carbon atoms, benzoyloxy, or trichloroacetoxy;

Y is trichloroacetyl, perfluoroacyl of the formula



or trialkylsilyl of the formula $[CH_3(CH_2)_m]_3Si$— wherein n is zero to six; and m is zero to three.

4,578,505

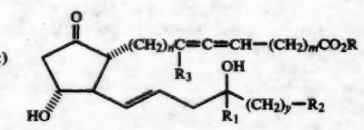
ALLENIC PROSTANOIC ACID DERIVATIVES

Paul W. Collins, Deerfield, and Richard M. Weier, Lake Bluff, both of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Filed Sep. 4, 1984, Ser. No. 647,090
Int. Cl.[4] C07C *177/00*
U.S. Cl. 560—118 **12 Claims**

1. A compound of the formula

XIV



wherein R is hydrogen; or straight or branched chain alkyl of 1 to 6 carbon atoms, inclusive

wherein R_1 is hydrogen; or straight or branched chain alkyl of 1 to 6 carbon atoms, inclusive; or vinyl (—CH=CH_2)

wherein R_2 is straight or branched chain alkyl of 1 to 6 carbon atoms; or cycloalkyl group containing 3 to 6 carbon atoms; or phenyl; or phenoxy

wherein R_3 is hydrogen; or straight chain alkyl of 1 to 3 carbon atoms

wherein m is an integer of from 1 to 4, inclusive;

wherein n is an integer of from 1 to 3, inclusive with the proviso that the sum of m and n does not exceed 5;

wherein y is an integer of from 1 to 3;

±refers to the compound shown, its mirror image and the mixture of racemates.

4,578,506

PROCESS FOR THE PREPARATION OF TRIS(N-CARBALKOXYLAMINOMETHYL)PHOSPHINE OXIDES AND SULFIDES

Arlen W. Frank, Slidell, La., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation-in-part of Ser. No. 156,292, Jun. 4, 1980, abandoned, which is a continuation-in-part of Ser. No. 964,852, Nov. 29, 1978, Pat. No. 4,249,017. This application Mar. 8, 1982, Ser. No. 355,953

The portion of the term of this patent subsequent to May 20, 1997, has been disclaimed.

Int. Cl.[4] C07F *9/53, 9/52*

U.S. Cl. 560—148 3 Claims

1. A process for preparing tris(N-carbalkoxylaminomethyl)-phosphine oxides and sulfides which comprises:

(a) reacting a tetrakis(N-carbalkoxylaminomethyl)phosphonium salt having the formula $(RO_2CNHCH_2)_4P^+X^-$, where R is an alkyl radical having from 1 to 6 carbon atoms and X is an inorganic radical, with a base selected from the group consisting of ammonia, primary amines, and secondary amines, at a molar ratio of said phosphonium salt to base of at least 1:2 and a temperature of about 0° C. to 150° C.,

(b) treating the reaction mixture at a temperature of about 0° C. to 100° C. with an agent selected from the group of oxidizing agents consisting of: air, oxygen, oxides of nitrogen, sulfur dioxide, hydrogen peroxide, mercuric oxide, potassium permanganate, chromic acid, and organic peroxides and epoxides or the group of sulfurizing agents consisting of: elemental sulfur, sodium polysulfide, ammonium sulfide, mercuric sulfide, thiocyanogen, and organic compounds selected from the group consisting of mercaptans, episulfides, thionocarbonates and dialkyl disulfides, and

(c) recovering the product from the resulting mixture of products and by-products.

4,578,507

PROCESS FOR THE PRODUCTION OF CINNAMIC ACID ESTERS

Keisuke Wada, Yokohama; Yoshimitsu Kobayashi, Tokyo, and Yukio Kasori, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Jan. 24, 1985, Ser. No. 694,211

Claims priority, application Japan, Feb. 10, 1984, 59-23837

Int. Cl.[4] C07C *69/76*

U.S. Cl. 560—104 1 Claim

1. A process for the production of cinnamic acid esters which is characterized by reacting a styrene with an aliphatic alcohol of 1–4 carbon atoms, carbon monoxide and oxygen in the presence of a catalyst comprising (a) a palladium metal or a compound thereof, (b) a salt of copper or iron, (c) a salt of an alkali metal or an alkaline earth metal, (d) an organic acid and (e) a halogen compound.

4,578,508

FLUOROACRYLATE ESTER, POLYMER THEREOF, AND PROCESS OF MAKING THE SAME

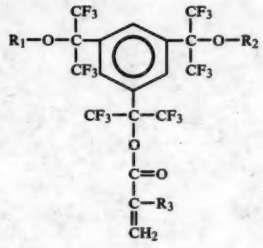
James R. Griffith, Riverdale Heights, and Jacques G. O'Rear, Temple Hills, both of Md., assignors to Geo-Centers, Inc., St. Newton Upper Falls, Mass.

Filed Feb. 26, 1985, Ser. No. 705,880

Int. Cl.[4] C07C *69/52*

U.S. Cl. 560—221 8 Claims

1. A compound comprising a fluoroacrylate ester of the formula:



(IV)

wherein R_1 and R_2 are independently selected from the group consisting of saturated aliphatic hydrocarbons having from 1 to about 3 carbon atoms and R_3 is selected from the group consisting of hydrogen and methyl.

4,578,509

PROCESS FOR PREPARING A MANIPULATED ENANTIOMER MIXTURE BY ASYMMETRIC CHIRAL PHASE TRANSFER CATALYSIS

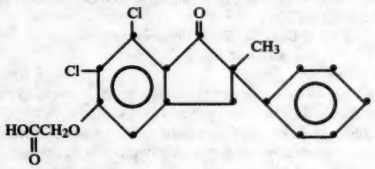
Ulf H. Dolling, Westfield; Seemon H. Pines, Murray Hill, and Edward J. J. Grabowski, Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 481,200, Apr. 1, 1983, abandoned. This application Feb. 17, 1984, Ser. No. 579,341

Int. Cl.[4] C07C *45/61, 59/90*

U.S. Cl. 562—462 26 Claims

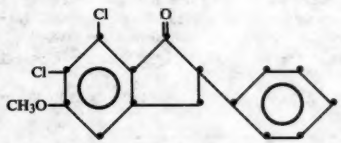
1. A direct process for producing a compound containing desired ratios of pure (+) and (−) enantiomers of [(6,7-dichloro-2,3-dihydro-2-methyl-1-oxo-2-phenyl-1H-inden-5-yl)-oxy]acetic acid having the formula:



I

which process comprises:

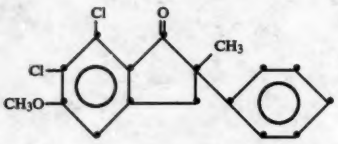
(a) reacting a racemic 2-phenylindanone compound having the formula:



VI

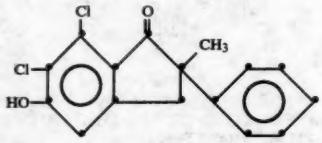
with a methylating agent and an aqueous base in an aprotic, aromatic hydrocarbon, chlorinated hydrocarbon, or simple hydrocarbon solvent and in the presence of an N-alkyl cinchona alkaloid catalyst or the mirror image thereof, said catalyst being a member of the group consisting of N-benzylcinchoninium halide, N-benzylcinchonidinium halide, N-benzylquininium halide, or N-benzylquinidinium halide and the dihydro analogs thereof and the o-, m-, and/or p-substituted benzyl analogs thereof wherein said substituents can be $—NO_2$, —CN, —F, —Cl, —Br, —I, $—OCH_3$, $—OCH_2CH_3$, $—CF_3$, or $—CH_3$, at a temperature of about −10° to 50° C. to obtain the 2-

methyl (+) and (−) enantiomeric intermediate having the formula:



VII

(b) demethylating said Formula VII compound in the presence of a catalyst to obtain the optically active (+) and (−) enantiomeric indanone intermediate compound having the formula



VIII

and,

(c) alkylating, hydrolyzing and acidifying said Formula VIII compound to obtain said Formula I compound containing said desired ratios of pure (+) and (−) enantiomers.

4,578,510

PROCESS FOR MINIMIZING FORMATION OF LOW MOLECULAR WEIGHT OLIGOMERS DURING HYDROLYTIC DEPOLYMERIZATION OF CONDENSATION POLYMERS

Marvin L. Doerr, Charlotte, N.C., assignor to Celanese Corporation, New York, N.Y.

Filed Dec. 11, 1984, Ser. No. 680,441
Int. Cl.⁴ C07C *51/487*
U.S. Cl. 562—483 **9 Claims**

1. A process for the depolymerization of a condensation polymer selected from the group consisting of polyesters, polyamides and polycarbonates which comprises subjecting said polymer to neutral aqueous hydrolysis while controlling the conditions such that the following two conditions are met:

(1) the amount of water and the polymer addition level are such that the least soluble depolymerization product does not exceed its solubility limits, assuming all of the polymer is converted to depolymerization products; and

(2) temperature conditions and aqueous concentrations of final depolymerization products are controlled so that at equilibrium the amount of low molecular weight oligomers is no greater than 7% of the theoretical, base on the amount of polymer used,

and recovering the depolymerization products from the hydrolysis zone.

4,578,511

METHOD OF PREPARING PURE BENZOIC ACID

Pietro P. Rossi, Garlasco; Paolo Senni, Colleferro, and Sergio Ferruzzi, Trieste, all of Italy, assignors to Chimica del Friuli S.p.A., Torviscosa and Snia BPD S.p.A., Milan, both of, Italy

Filed Mar. 9, 1984, Ser. No. 587,896
Claims priority, application Italy, Mar. 11, 1983, 20042 A/83
Int. Cl.⁴ C07C *51/42*
U.S. Cl. 562—494 **2 Claims**

1. A method of purifying benzoic acid, as obtained by catalytic oxidation of toluene and purification by rectification wherein the secondary streams are cycled back into the oxidation reactor, characterized in that the secondary streams leaving the stripping column are caused to undergo the following sequential steps:

(a) at least one distillation and at least one crystallization in an organic solvent;

(b) scrubbing of the crystals from (a) using the same solvent as in (a);

(c) cycling of the mother liquors from the crystallization as in (a) plus the mother liquors from (b) back into the dissolver;

(d) further scrubbing of the crystals from (b) using the same solvent as in (a), the scrubbing liquors being cycled back; and optionally

(d1) further scrubbing of the crystals as scrubbed in (d) with water.

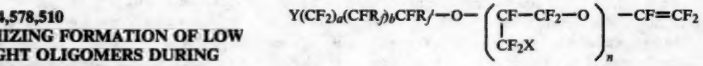
4,578,512

PROCESS TO PRODUCE NOVEL FLUOROCARBON VINYL ETHERS AND RESULTING POLYMERS

Bobby R. Ezzell, Lake Jackson; William P. Carl, Angleton, and William A. Mod, Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 158,532, Jun. 11, 1980, abandoned.
This application Feb. 4, 1982, Ser. No. 345,894
Int. Cl.⁴ C07C *69/65, 69/52*
U.S. Cl. 562—586 **9 Claims**

1. As a composition of matter, compounds represented by the formula



where

n=1 to 6;

X=Cl, Br or mixtures thereof when n>1

Y=an acid group or an acid derivative easily convertible to an acid group;

R_f and R_f' are independentiy selected from the group consisting of F, Cl, a perfluoroalkyl radical and a chlorofluoroalkyl radical;

a=0 or an integer greater than 0;

b=0 or an integer greater than 0.

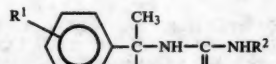
4,578,513

PROCESS FOR PREPARING PHENYLISOPROPYLUREA COMPOUNDS

Balwant Singh, Stamford, and Paul S. Waterman, Shelton, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Nov. 16, 1984, Ser. No. 672,038
Int. Cl.⁴ C07C *127/17*
U.S. Cl. 564—56 **10 Claims**

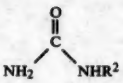
1. A process for preparing phenylisopropyl urea derivatives of the formula:



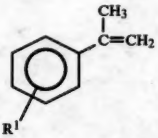
wherein R^1 is selected from hydrogen, alkyl, alkenyl, halogen, haloalkyl or R^2 and R^2 is selected from phenyl or alkyl-, alkoxy- or haloalkyl-substituted phenyl, said process comprising:

(a) providing a reaction mixture comprising:

(i) a substituted urea of the formula



wherein R^2 is the same as defined above;
(ii) a highly polar aprotic solvent; and
(iii) an effective amount of an acid catalyst;
(b) thereafter, adding an alkenyl aromatic compound of the formula:



wherein R^1 is the same as described above; and
(c) stirring the reaction mixture of step (b) at a temperature of from about 20° to about 80° C. until formation of the phenylisopropylurea derivative is substantially complete.

4,578,514

SYNTHESIS OF SULFILIMINES

Daniel P. Getman, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Nov. 1, 1984, Ser. No. 667,180
Int. Cl.[4] C07C *145/02*
U.S. Cl. 564—102 **24 Claims**

1. The process of preparing N-phenyl sulfilimines which comprises reacting a phenyl isocyanate with a dihydrocarbyl sulfoxide in the presence of strong acid effective to cause reaction of isocyanate with sulfoxide, and producing such sulfilimines.

4,578,515

PREPARING N-VINYLFORMAMIDE

Daniel J. Dawson, Los Altos, and Kenneth M. Otteson, Redwood City, both of Calif., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Division of Ser. No. 318,615, Nov. 5, 1981, Pat. No. 4,490,557. This application Jun. 7, 1984, Ser. No. 618,420
Int. Cl.[4] C07C *103/127*
U.S. Cl. 564—215 **3 Claims**

1. A process for preparing N-vinylformamide which comprises contacting a liquid admixture comprising formamide, acetaldehyde, and an ammonia scavenger with a catalytic amount of an acidic catalyst at a temperature greater than 50° C. and under conditions sufficient to thereby form an ethylidene bisformamide reaction product, separating said reaction product from the catalyst and recovering from it ethylidene bisformamide using a low residence time-high surface area evaporator, heating the recovered ethylidene bisformamide at a temperature of from 150° to 750° C. in the presence of an inorganic nonacidic surface catalyst for a period of time sufficient to pyrolyze the bisformamide and form a pyrolysis reaction product, and separating N-vinylformamide from the pyrolysis reaction product.

3. A process for preparing N-vinylformamide which comprises contacting a substantially water-free liquid admixture comprising formamide, acetaldehyde and acetic anhydride with a catalytic amount of a solid cation exchange resin catalyst for a period of 0.50 hours to 24 hours inclusive at a temperature of from 50° C. to 120° C. thereby forming an ethylidene bisformamide—containing reaction product, separating said reaction product from said catalyst, and recovering the ethylidene bisformamide by using a wiped film evaporator, heating the recovered ethylidene bisformamide at a temperature of 300° to 425° C. and the presence of marble chips for a period sufficient to pyrolyze the ethylidene bisformamide and form an N-vinylformamide-containing reaction product and recovering the N-vinylformamide from said reaction product.

4,578,516

PROCESS FOR PRODUCING DIMETHYLAMINE IN PREFERENCE TO MONO- OR TRIMETHYLAMINE BY VAPOR-PHASE CATALYTIC REACTION OF METHANOL AND AMMONIA

Yoshiro Ashina, Zushi; Takeyuki Fujita, Yokosuka; Michio Fukatsu, and Junsuke Yagi, both of Yokohama, all of Japan, assignors to Nitto Kagaku Kogyu Kabushiki Kaisha, Tokyo, Japan

Filed May 7, 1984, Ser. No. 607,679
Claims priority, application Japan, May 13, 1983, 58-82768
Int. Cl.[4] C07C *85/06*
U.S. Cl. 564—479 **7 Claims**

1. In a process for producing dimethylamine through a reaction (a) between methanol and ammonia, (b) between methanol, a mixture of methylamines and ammonia, or (c) between a mixture of methylamines and ammonia in gas phase over a solid catalyst, the improvement wherein the solid catalyst is a mordenite type zeolite having an Na content of 0.2 to 2.1 g per 100 g of the catalyst and a total content of 0.01 to 0.20 mole of an alkali metal selected from the group of Na, K and Li per 100 g of the catalyst, and wherein the reaction is carried out at a temperature of 270° to 350° C. and at a methanol conversion of about 80 to 97.9%, thereby to produce dimethylamine in substantial preference to mono- or trimethylamine.

4,578,517

POLYALKYLENE POLYAMINES FROM ALKANOLAMINE AND AMMONIA OR AMINES USING GROUP IIIB METAL ACID PHOSPHATE CATALYSTS

Thomas A. Johnson, Orefield, and Michael E. Ford, Center Valley, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Sep. 16, 1983, Ser. No. 533,319
Int. Cl.[4] C07C *85/06*
U.S. Cl. 564—479 **42 Claims**

1. A process for preparing a polyalkylene polyamine, which comprises:

contacting ammonia or a primary or secondary amine with an alkanolamine compound having an amino group and a primary or secondary hydroxy group in the presence of a catalytically effective amount of a Group IIIB metal acid phosphate at a temperature sufficient to effect reaction between the ammonia or amine and the alkanolamine compound under a pressure sufficient to maintain a substantial amount of the ammonia or amine in the reaction zone.

4,578,518

CATALYTIC (CALCINED CATALYST AND) PREPARATION OF LINEAR POLYETHYLENEPOLYAMINES (THEREWITH)

Steven H. Vanderpool, New Braunfels, and Lewis W. Watts, Jr., Austin, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 455,158, Jan. 3, 1983. This application Dec. 22, 1983, Ser. No. 564,152
The portion of the term of this patent subsequent to Mar. 25, 2003, has been disclaimed.
Int. Cl.[4] C07C *85/06*
U.S. Cl. 564—479 **6 Claims**

1. In a method wherein monoethanolamine is reacted with ethylenediamine in the presence of a phosphorus containing catalyst to provide an essentially noncyclic product comprising polyethylenepolyamines, the improvement for conducting said process on a continuous basis which comprises:

a. using, as a catalyst, thermally activated calcined pelleted

titania containing titanium triphosphate and having thermally chemically bonded to at least the surface thereof about 0.5 to about 10 wt.% of phosphorus, said catalyst having been prepared by treating titania pellets with phosphoric acid for a period of time ranging from about 0.5 to about 5 hours, thereafter water washing, recovering and drying the thus-treated pellets and then calcining the pellets at about 200° C. to about 800° C. for about 1 to about 24 hours,

b. continuously contacting a mixture of ethylene diamine and monoethanolamine in a molar ratio of about 1 to 5 moles of ethylenediamine per mole of monoethanolamine with said pelleted catalyst at a temperature of about 250° to about 400° C. and a pressure of about 500 to about 3000 psig. to obtain an essentially noncyclic reaction product.

4,578,519

CATALYTIC SYNTHESIS OF LINEAR POLYETHYLENEPOLYAMINES (POLYETHYLENEPOLYAMINE PREPARATION AND CATALYST)

John M. Larken, Austin, and Steven H. Vanderpool, New Braunfels, both of Tex., assignors to Texaco Inc. (Parent), White Plains, N.Y.

Division of Ser. No. 455,159, Jan. 3, 1983. This application Dec. 22, 1983, Ser. No. 564,587

Int. Cl.⁴ C07C *85/06*

U.S. Cl. 564—479 **6 Claims**

1. In a method wherein monoethanolamine is reacted with ethylenediamine in the presence of a phosphorus containing catalyst to provide an essentially noncyclic product comprising polyethylenepolyamines, the improvement for conducting said process on a continuous basis which comprises:

a. using, as a catalyst, thermally activated calcined pelleted titania having thermally chemically bonded to at least the surface thereof about 0.5 to about 10 wt. % of phosphorus, said catalyst having been prepared by treating titania pellets with polyphosphoric acid for a period of time ranging from about 0.5 to about 5 hours, and thereafter water washing, recovering and drying the thus-treated pellets,

b. continuously contacting a mixture of ethylene diamine and monoethanolamine in a molar ratio of about 1 to 5 moles of ethylenediamine per mole of monoethanolamine with said pelleted catalyst at a temperature of about 250° to about 400° C. and a pressure of about 500 to about 3000 psig. to obtain an essentially noncyclic reaction product.

4,578,520

PHLOROPHENONE DERIVATIVES, PROCESSES FOR PREPARING SUCH COMPOUNDS, USES AND PHARMACEUTICAL COMPOSITIONS OF PHLOROPHENONE COMPOUNDS

Theunis G. Fourie; Theodor G. Dekker; Friedrich O. Snyckers, and Cornelis J. van der Schyf, all of Pretoria, South Africa, assignors to Noristan Limited, Pretoria, South Africa

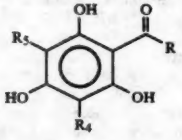
Division of Ser. No. 390,415, Jun. 21, 1982, Pat. No. 4,503,256. This application Dec. 7, 1984, Ser. No. 679,272

Claims priority, application South Africa, Jul. 2, 1981, 81/4480

Int. Cl.⁴ C07C *45/68*

U.S. Cl. 568—315 **18 Claims**

1. A process for preparing compounds of formula A



(A)

wherein

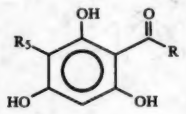
R is a branched or unbranched alkyl, cycloalkyl or aralkyl group, which group is optionally substituted by a halogen, hydroxy or alkoxy group;

R_4 is an alkyl, alkenyl or aralkyl group, which group optionally contains as a substituent an alkyl, aryl, aralkyl, halogen, hydroxy, or alkoxy group; and

R_5 is hydrogen, halogen, an alkyl, aralkyl, alkanoyl or aryl group, which group optionally contains as a substituent an alkyl, aryl, aralkyl, halogen, hydroxy or alkoxy group;

and pharmaceutically acceptable salts thereof;

which process comprises reacting a compound of formula B



(B)

wherein R and R_1 are as defined above, with an appropriate organic halide being R_4-halide wherein R_4 is as defined above in the presence of a cuprous chloride catalyst and a base being a carbonate base or a like base having a similar pH range.

4,578,521

SHAPE-SELECTIVE CATALYTIC OXIDATION OF PHENOL

Clarence D. Chang, Princeton, and Stuart D. Hellring, Plainsboro, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 4, 1985, Ser. No. 697,804

Int. Cl.⁴ C07C *39/08, 37/60*

U.S. Cl. 568—771 **14 Claims**

1. A process for shape-selective oxidation of phenol which comprises reacting phenol with hydrogen peroxide at a temperature between about 0°–150° C. in the presence of a zeolite catalyst having a Constraint Index between about 2–10 and an Alpha value greater than about 20, and producing hydroquinone product.

4,578,522

BIARYL ALDEHYDE

John F. Eaddy, III, Rte. 12, Box 127-A, Chapel Hill, N.C. 27514

Division of Ser. No. 529,767, Aug. 31, 1983, abandoned, which is a continuation of Ser. No. 371,581, Apr. 26, 1982, abandoned. This application Sep. 14, 1984, Ser. No. 650,981

Int. Cl.⁴ C07C *47/55*

U.S. Cl. 568—425 **1 Claim**

1. 4'-Trifluoromethyl-2-biphenylcarbaldehyde.

4,578,523

PROCESS FOR THE PREPARATION OF ALDEHYDES

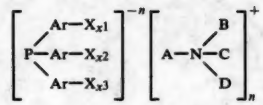
Helmut Bahrmann, Hamminkeln; Boy Cornils, Dinslaken; Werner Konkol, and Wolfgang Lipps, both of Oberhausen, all of Fed. Rep. of Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed May 29, 1985, Ser. No. 738,822

Int. Cl.⁴ C07C *45/50*

U.S. Cl. 568—454 **5 Claims**

1. In a process for the preparation of aldehydes by reacting olefins with carbon monoxide and hydrogen in the liquid phase in the presence of water and rhodium in metallic form or as a compound as well as a water-soluble arylphosphine at temperatures of 20° to 150° C. and 1 to 200 bar (100 to 2×10^4 kPa), the improvement comprising that the water-soluble phosphine has the formula



where Ar is aryl and X is a sulfonic acid x^1, x^2 and x^3 are 0 or 1 with the proviso that at least one of x^1, x^2 or x^3 is 1, A is selected from the group consisting of an alkyl of 1 to 18 carbon atoms and aralkyl of 7 to 18 carbon atoms and B,C,D are alkyl of 1 to 4 carbon atoms and n is a whole number between 1 and 3.

4,578,524

CARBON DIOXIDE-ENHANCED MONOALKYLENE GLYCOL PRODUCTION

Brian T. Keen, Charleston, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 28, 1984, Ser. No. 594,265

Int. Cl.[4] C07C *31/20, 33/26, 35/14, 33/035*

U.S. Cl. 568—867 **15 Claims**

1. A process for the production of monoalkylene glycol comprising reacting a vicinal alkylene oxide with water in the presence of (a) a vanadate-containing adjuvant to enhance the selectivity of the reaction to monoethylene glycol, said vanadate-containing adjuvant comprising at least one dissociatable metavanadate, hydrogen pyrovanadate, pyrovanadate and orthovanadate anion such that when the vanadate anions present are characterized as a mole ratio of metavanadate to orthovanadate, the mole ratio is less than 2.2:1, and (b) carbon dioxide in the amount of between about (i) 0.5-M/O to (ii) 2.2-M/O moles of carbon dioxide per mole of vanadium atoms, wherein M/O is the calculated mole ratio of metavanadate to orthovanadate characterizing the vanadate anions, provided that at least 0.01 mole of carbon dioxide is provided per mole of vanadium atoms.

4,578,525

PROCESS FOR EXTRACTING POLAR ORGANIC COMPOUNDS, IN PARTICULAR LOWER ALIPHATIC ALCOHOLS, FROM THEIR AQUEOUS SOLUTIONS, AND FLUIDS PARTICULARLY SUITABLE FOR THIS PURPOSE

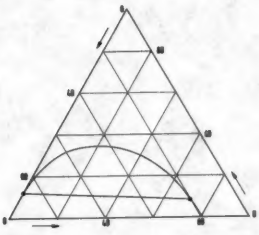
Harald Brückner, Berlin, Fed. Rep. of Germany, assignor to Krupp Industrietechnik Werk Buckau-Wolf, Grevenbroich; Starcosa GmbH, Brunswick and Versuchs- und Lehranstalt für Spiritusfabrikation und Fermentationstechnologie in Berlin, Berlin, all of, Fed. Rep. of Germany

Filed Sep. 26, 1983, Ser. No. 535,879

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1982, 32364962

Int. Cl.[4] C07C *29/86, 31/08, 45/80*

U.S. Cl. 568—918 **17 Claims**



1. A process for separating polar organic compounds, in particular lower aliphatic alcohols, from their aqueous solutions by extracting the aqueous solution with a liquid extractant and separating the polar organic compound from the extract, wherein the aqueous solution is extracted with at least one liquid polyoxaalkanol, polyoxaalkanediol and/or polyoxaalkanepolyol which has a low solubility in water at 30° C., namely of less than 1% by mass, and a parameter, K_Z, which has a numerical value of at least 100 and is defined by the following equation:

$$K_Z = \frac{M}{\sqrt{2\,o + oh}}$$

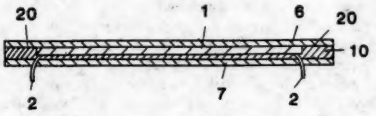
in which "M" denotes the molar mass which is greater than 250 g/mol, "o" denotes the number of ether groups and "oh" denotes the number of hydroxyl groups, and in which compounds the numerical ratio of —CH(A)— groups to ether groups is within the range from about 2.3:1 to 10:1, where A represents hydrogen, CH_3 and/or OH.

4,578,526

SOLAR MODULE

Akihiko Nakano, Itami; Hitoshi Matsumoto, Osaka; Hiroshi Uda, Ikoma; Yasumasa Komatsu, Sakai; Kiyoshi Kuribayashi, Hirakata, and Seiji Ikegami, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 31, 1984, Ser. No. 636,245
Claims priority, application Japan, Aug. 1, 1983, 58-141333
Int. Cl.[4] H01L *27/14*
U.S. Cl. 136—251 4 Claims



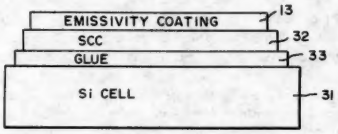
1. A solar module comprising:
a glass superstrate;
a solar cell array comprised of a plurality of Group II-IV compound semiconductor solar cells, formed on said glass superstrate while leaving a margin along the periphery of said glass superstrate; and
a resin layer coated on said solar cell array and said peripheral margin of said glass superstrate, wherein said resin layer is made of a fluoropolymer derived from a compound containing a perfluoroalkylene group and active hydrogen atoms.

4,578,527

ARTICLES HAVING IMPROVED REFLECTANCE SUPPRESSION

James D. Rancourt, and William T. Beauchamp, both of Santa Rosa, Calif., assignors to Optical Coating Laboratory, Inc., Santa Rosa, Calif.

Filed Nov. 16, 1983, Ser. No. 552,294
Int. Cl.[4] G02B *1/10*; H01L *31/04*; B64G *1/00*
U.S. Cl. 136—256 19 Claims



15. In a solar cell assembly, a solar cell, a solar cell cover covering the solar cell, the solar cell cover being formed of fused silica and an emissivity enhancement coating carried by the solar cell cover, the emissivity enhancement coating being formed of a spacer layer and an absorber layer, the spacer layer being characterized in that it is formed of a material having a low index of refraction and has an optical thickness ranging from approximately one-quarter of a wavelength and less, said absorber layer being characterized in that it is formed of a material which has a complex index of refraction which as a function of wavelength is relatively close to that of fused silica.

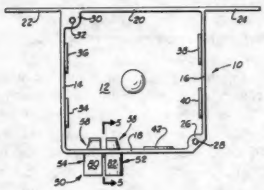
4,578,528

ELECTRICAL OUTLET BOX AND METHOD OF MANUFACTURING SAME

Richard J. Borsh, Chagrin Falls; Robert W. Ripley, Brecksville, and Harold T. Pate, Solon, all of Ohio, assignors to Thyssen-Bornemisza, Inc., (TBG Inc.), New York, N.Y.

Filed Jul. 29, 1983, Ser. No. 518,737
Int. Cl.[4] H02G *3/08*
U.S. Cl. 174—65 G 2 Claims

1. In combination, a hollow, synthetic resin electrical box, and a connector fitting for joining a tubular conduit to the box, comprising:
a back wall;
at least one side wall extending substantially normal to the back wall and forming with the back wall, a hollow, open sided enclosure;
a round hole in one of said side walls, said hole having a cylindrical, smooth-walled boundary, with said one side wall adjacent and surrounding said hole having a thickness of from about 0.05inch to about 0.25 inch;
a smooth-walled, cylindrical indentation in one of said side walls;
a cylindrical plug closing the bottom of said indentation, said plug projecting from the plane of the lastmentioned side wall into the interior of the box; and
a connector fitting extending into and through the hole and engaging the side wall of the box, said connector fitting including a pair of semi-cylindrical halves, each of said semi-cylindrical halves including:
a semi-cylindrical body portion located outside said box and having a larger diametric dimension than said hole, and having an axial length facilitating gripping said pair of body portions with the fingers and thumb extended around the outer side thereof whereby the connector fitting may be utilized to manually force a knockout plug out of said side wall to leave said round hole as said connector fitting is extended into and through the hole and attached to said side wall; and
at least two wedge-shaped end portions connected to each of said semi-cylindrical body portions, each of said wedge-shaped end portions being formed on a sector of



a cylinder, and each of said wedge-shaped end portions being located inside said box and including
a beveled radially outer surface which slopes axially toward the inside of said box, and also slopes radially inwardly; and
a semi-cylindrical lip at the axial end of said beveled radially outer surface farthest inside said box, said semi-cylindrical lip having an outer, semi-cylindrical surface formed on a uniform diameter, and said semi-cylindrical lip having a radiused inner side at its free, axially inner end farthest inside said box, whereby a conductor bearing against and contacting said radiused inner side at the free, axially inner end of said cylindrical lip will not be cut or unduly chafed by said contact with said inner side, and whereby said wedge-shaped end portions collectively form a generally cylindrical punch member by which a substantial axial force imposed upon said connector fitting and acting through said semi-cylindrical halves in the direction of said wedge-shaped end portions can be brought to bear on the semi-cylindrical lips at the axially inner end of the beveled radially outer surface of said wedge-shaped end portions to thereby facilitate forcing a plug out of said round hole at the time said connector fitting is extended into and through the hole for attachment to said side wall;
said connector fitting further having an annular external groove therearound at the intersection of said body portions with said wedge-shaped end portions, said groove receiving said cylindrical, smooth-walled boundary of said hole therein after said connector fitting has been used to press one of said plugs out of said hole; and

a flexible loop interconnecting said semi-cylindrical body portions to hold said semi-cylindrical body portions in a symmetrical, complementary relationship to each other prior to insertion thereof into said round hole.

4,578,529

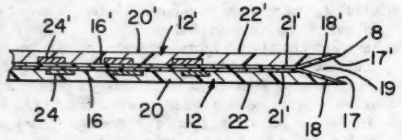
FLAT PEELABLE CABLE

Raymond J. Look, Largo, Fla., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 508,701, Jun. 28, 1983, which is a division of Ser. No. 332,271, Dec. 18, 1981, abandoned. This application Aug. 2, 1984, Ser. No. 637,248

Int. Cl.[4] H01B 7/08

U.S. Cl. 174—117 FF **4 Claims**



4. A flat multiconductor cable of the type having two adjacent cable members separated by dielectric internal laminas,

a plurality of flat parallel linear conductors of each said cable member being disposed against respective sides of each said internal lamina and having a precise spacing between adjacent conductors in each cable member, said conductors having been adhered to each said internal lamina while being drawn through aligning means with said internal laminas;

two said dielectric internal laminas with continuous bonding therebetween separating said cable members, each said internal lamina has a first surface and a second surface, said first surfaces being juxtaposed, said second surfaces being disposed against respective cable members, said internal laminas having continuous bonding between said first surfaces thereof and continuous bonding between the second surfaces thereof in adjacent cable members, said continuous bonding between said second surfaces of said internal laminas and said cable members providing greater adhesion than the bonding between the first surfaces of said internal laminas, whereby the cable members may be separated by peeling apart the first surfaces of said internal laminas without disturbing the bonding between the internal laminas and the adjacent cable members; and

a dielectric external layer disposed against each said internal lamina to overlie and enclosed said conductors, said external layers having been extruded against said conductors and said internal laminas.

4,578,530

END-TO-END ENCRYPTION SYSTEM AND METHOD OF OPERATION

Howard M. Zeidler, Palo Alto, Calif., assignor to VISA U.S.A., Inc., San Mateo, Calif.

Continuation-in-part of Ser. No. 278,001, Jun. 24, 1981, Pat. No. 4,423,287. This application Dec. 7, 1983, Ser. No. 558,916

The portion of the term of this patent subsequent to Dec. 27, 2000, has been disclaimed.

Int. Cl.[4] H04L 9/00

U.S. Cl. 178—22.09 **12 Claims**

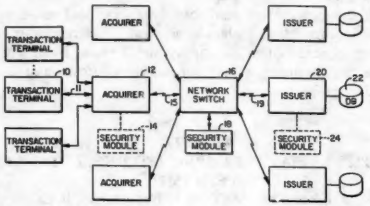
7. Improved network/interchange transaction execution apparatus of the type comprising a plurality of issuer stations, each having a host data processor which stores account information for a plurality of accounts, a plurality of transaction terminals, a plurality of acquirer stations, each being connected to at least one, separate transaction terminal, and a network switch station communicatively interconnected between the acquirer stations and the issuer stations, and further comprising:

(a) means at each transaction terminal for receiving the transaction data and a personal identification number, PINc, from a user, for encrypting the PINc with a first session key, KS_n, and for transmitting to the acquirer station connected to said transaction terminal, a network-/interchange request message comprised of the encrypted PINc and the transaction data;

(b) means at said acquirer station for receiving the network-/interchange request message from said transaction terminal and for retransmitting the network/interchange request message, including the session key encrypted in a second master key, $e[KM_2](KS_n)$, to the network switch;

(c) means at the network switch for retransmitting the network/interchange request message to a particular issuer station as specified in transaction data of the network/interchange request and for reencrypting the session key from second master key encryption to encryption in a third master key, $e[KM_3](KS_n)$;

(d) means at said issuer station for receiving the network/interchange request message, including the encrypted session key, $e[KM_3](KS_n)$, for decrypting the session key, for encrypting the encrypted PINc, for accessing the data base for the account specified in the transaction data, for comparing and verifying the PINc with the corresponding PIN stored in the data base for that account for specifying the authorization code in response to the transaction data, and for transmitting the authorization code to the network switch for relay to said acquirer station;



(e) means at said acquirer station for generating, encrypting and storing a plurality of encrypted pairs of session keys for each terminal, each key being encrypted once in a first master key and once in a second master key and, in addition, computing a session key authentication code SKAC unique to each encrypted pair of session keys, and means at said acquirer station for appending a new first master key encrypted session key $e[KM_1](KS_{n+1})$ along with the corresponding $SKAC_{n+1}$ to the authorization code and relaying the authorization code to the transaction terminal; and

(f) means at said transaction terminal for recomputing and verifying the $SKAC_{n+1}$ and acting on the authorization code to respond to the transaction terminal user.

4,578,531

ENCRYPTION SYSTEM KEY DISTRIBUTION METHOD AND APPARATUS

Joseph R. Everhart, Holmdel, and Jeffrey G. Osborn, Old Bridge, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 9, 1982, Ser. No. 386,805

Int. Cl.[4] H04K 1/02

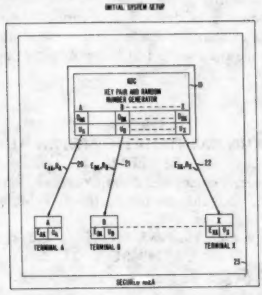
U.S. Cl. 178—22.08 **18 Claims**

1. A key distribution method for communicating cipher keys between two terminals via a key distribution center, KDC, said method comprising

establishing between any one terminal and said key distribu-

tion center a terminal-unique cipher key for controlling the generating of session keys,

cooperating by transmitting information using said established terminal-unique cipher key between said KDC and said one terminal on a subsequent connection between said KDC and said one terminal to establish a session key for



use by said one terminal in a subsequent secure transmission between said one terminal and a second terminal, and

changing said priorly established terminal-unique cipher key in response to use of said priorly established terminal-unique cipher key on said subsequent connection between said one terminal and said KDC.

4,578,532
METHOD AND APPARATUS FOR CODE TRANSMISSION

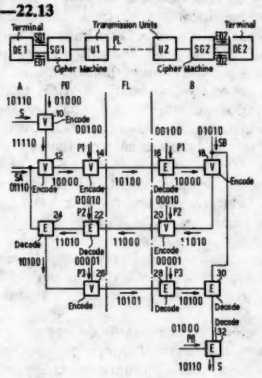
Wernhard Markwitz, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 2, 1982, Ser. No. 384,235

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1981, 3123168

Int. Cl.[4] H04L *9/04*

U.S. Cl. 178—22.13 **6 Claims**



1. A method for establishing a transmission code simultaneously at a transmitting and a receiving station for the encoded subsequent transmission of messages, each of said stations having cipher machines for producing a station code individual to said station, comprising the steps of:

encoding the transmission code at the transmitting station with the transmitting station code and a first password and a fourth password known to both stations;

transmitting the encoded result from the transmitting station to the receiving station;

decoding the result at the receiving station using said first password, and encoding the result of such decoding with the station code of said receiving station and a second password;

transmitting the new encoded result back to the transmitting station;

decoding the transmission at the transmitting station using said second password and the said station code of the transmitting station;

encoding the decoded result with a third password and trasmitting the newly encoded result to the receiving station; and

decoding the trasmission at the receiving station with said third passwod and said forth password and the station code of said receiving station in order to derive the transmission code.

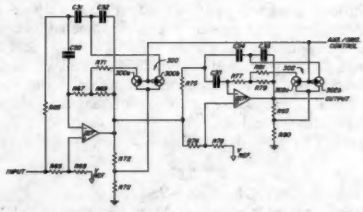
4,578,533
SWITCHABLE LINE POWERED MODEM

O. Leon Pierce, Huntsville, Ala., assignor to Universal Data Systems, Inc., Huntsville, Ala.

Continuation of Ser. No. 203,111, Nov. 3, 1980, abandoned. This application Feb. 17, 1984, Ser. No. 580,279

Int. Cl.[4] H04M *11/00*

U.S. Cl. 179—2 DP **18 Claims**



18. For use in a telephone line powered modem which includes a receiver operative to provide data signals derived from signals received on a telephone line, and a transmitter operative in response to data from a source to provide modulated data signals for transmission on the telephone line, a switchable filter operative wholly in response to telephone line power and comprising:

at least one active filter comprising a feedback network which includes solid state low power switch means;

in a first switch mode the filter exhibits a band-pass characteristic in one band of frequencies and a band-reject characteristic in another band of frequencies;

in a second switch mode the filter exhibits the band-pass characteristic in the other band of frequencies and the band-reject characteristic in the one band of frequencies;

wherein the band-reject characteristic exhibits a notch.

4,578,534
TIME INDEPENDENT DATA TRANSMISSION SYSTEM

Edwin F. Shelley, 339 Oxford Rd., New Rochelle, N.Y. 10804

Filed Aug. 23, 1984, Ser. No. 643,450

Int. Cl.[4] H04M *11/08*

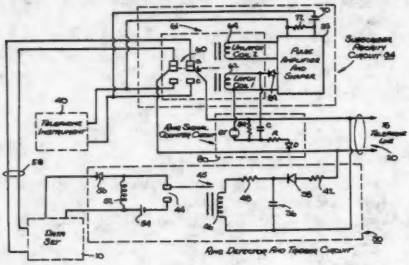
U.S. Cl. 179—2 C **11 Claims**

1. An apparatus coupling a telephone data set and a telephone instrument to a telephone transmission line so as to enable the communication of data between the data set and a remote location without interfering with normal use of the telephone instrument, comprising:

first means, coupled to said telephone transmission line, said telephone instrument and said data set and normally connecting said data set to said telephone transmission line, for disconnectingg said data set from said telephone transmission line and connecting said telephone instrument to said telephone transmission line in response to any of selected ones of a plurality of first electrical signals trans-

mitted on said telephone transmission line, said first signals each being indicative of a call from a caller on said telephone transmission line, said first means preventing disconnection of said data set in response to a selected one of said first signals;

second means, coupled to said telephone transmission line and said data set, for detecting any of said first electrical signals transmitted on said telephone transmission line



without answering the call and for generating a second electrical signal when any of the first electrical signals on said telephone transmission line has terminated, indicating that the caller has hung up;

said data set being adapted to communicate data via said first means in response to the generation of said second electrical signal after said selected one of said first electrical signals has terminated.

4,578,535

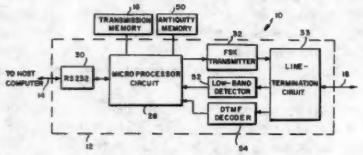
VIDEOTEX SYSTEM

Richard M. Simmons, Cambridge, Mass., assignor to Telelogic, Inc., Cambridge, Mass.

Filed May 8, 1984, Ser. No. 608,115

Int. Cl.[4] H04M *11/00*

U.S. Cl. 179—2 DP **7 Claims**



4. A communications module for sending digital signals representing display characters and display-screen positions at which they are to be displayed, the communications module comprising:

A. a transmission memory including transmission-memory locations, associated with display positions in an intended display, for containing display codes representing display characters to be displayed at the display positions, the transmission memory being operable to have display codes written into the transmission-memory locations and to have display codes read therefrom;

B. an antiquity memory including antiquity-memory locations, each antiquity-memory location being associated with a transmission-memory location;

C. a control circuit, connected to write information into and read information from the antiquity and transmission memories and adapted to receive information from a data source, for writing information from the data source into transmission-memory locations, for, upon writing information into a transmission-memory location, resetting the contents of the antiquity-memory location associated therewith to indicate that the number of transmissions since the last writing is zero, for repeatedly transmitting the contents of the transmission memory, and for, upon transmission of the contents of a transmission-memory location, modifying the contents of the antiquity-memory location associated therewith to increment the number of transmissions indicated thereby, the control circuit preferentially transmitting the contents of the transmission-memory locations associated with antiquity-memory locations whose contents indicate the lowest number of transmissions since data were last written into those transmission-memory locations.

4,578,536

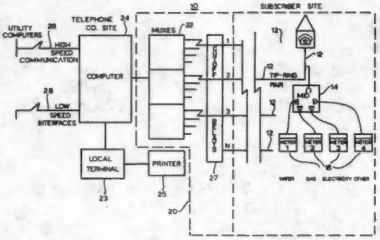
CENTERPOINT AUTOMATIC METER READING SYSTEM

Stewart W. Oliver, Venice, and John Cosgrove, Playa del Rey, both of Calif., assignors to International Teldata Corp, Las Vegas, Nev.

Filed Oct. 19, 1983, Ser. No. 543,372

Int. Cl.[4] H04M *11/00*

U.S. Cl. 179—2 AM **5 Claims**



1. A utility meter reading system for sending utility usage information over a plurality of telephone lines to a telephone central office comprising:

a plurality of interface means, connected to serve a plurality of utility meter locations, at least one interface means coupled to each of the telephone lines and each interface means coupled to at least one utility usage monitor for receiving usage information therefrom and for sending alternating current representations of the usage information over its discrete telephone line to a telephone central office responsive to receiving at least one distinct alternating current interrogation signal from its discrete telephone line;

means establishing a continuous ON-HOOK direct current connection between said central office and said plurality of interface means via said telephone lines;

a plurality of multiplexer means at said central office continuously connected to a preselected group of said telephone lines for multiplexing signals communicated between said preselected group of telephone lines and said central office;

means at said telephone central office for sending at least one distinct alternating current interrogation signal via said multiplexer means to a plurality of said interface means over each of the plurality of telephone lines;

computer means for selecting each of a plurality of said multiplexer means;

said computer means selecting one of a plurality of telephone lines for receipt of said interrogation signal;

means at said central office for passing ON-HOOK direct current between said central office and said telephone lines whereby said system establishes continuous direct current and alternating current coupling to said telephone lines during ON-HOOK conditions;

means at said telephone central office for receiving the plurality of alternating current representations of utility usage information from said plurality of interface means;

means at said telephone central office for converting the alternating current representations into a plurality of digital representations, each digital representation being a digital representation of utility usage information from a single utility usage meter location; and,

means for communicating the plurality of digital representations to a utility usage information device;

whereby said system allows the monitoring of any of a plurality of remote utility meters selectively under the control of a computer of any ON-HOOK telephone line without the necessity of dialing up any line.

4,578,537

TELECOMMUNICATION APPARATUS SERVING AS AN INTERFACE BETWEEN A DIGITAL COMPUTER AND AN ANALOG COMMUNICATION MEDIUM

Federico Faggin, Los Altos Hills; Jerry A. Klein, Los Altos; Lauren F. Yazolino, Oakland; Robert Korody; Eric P. L. Ha, both of Cupertino, all of Calif., and Stephan Kerman, Southbury, Conn., assignors to International Remote Imaging Systems, Inc., Chatsworth, Calif.

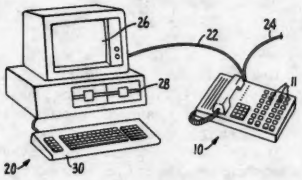
Filed Aug. 5, 1983, Ser. No. 520,738

The portion of the term of this patent subsequent to Jun. 18, 2002, has been disclaimed.

Int. Cl.[4] H04M *11/00*

U.S. Cl. 179—2 DP **2 Claims**

MICROFICHE APPENDIX INCLUDED
(9 Microfiche, 550 Pages)



1. An interface apparatus between a digital computer and an analog communication medium, said interface apparatus comprising:

telephony means for transmitting and receiving voice signals to and from said medium;

modem means for for communication with said computer and said medium for transmitting and receiving data signals to and from said medium for said computer;

switch means interposed between said communication medium said telephony means, and said modem means; said switch means are adapted to connect said medium and said telephony means and said modem means in a first position and in a second position, wherein in said first position said telephony means are connected to transmit and to receive voice signals to and from said medium and said modem means are connected to receive data carrier signals from said medium; and wherein in said second position, said telephony means are disconnected from said medium and said modem means are connected to transmit and to receive digital data signals to and from said medium;

control means for controlling said switch means between said first position and said second position; said control means for automatically switching said switch means from said first position to said second position when said apparatus transmits data signals to said medium or when said modem means detects said data carrier signals; and said control means for automatically switching said switch means from said second position to said first position when said apparatus terminates the transmission of digital data signal to said medium or when said modem means ceases to receive data signals from said medium; and

interrupt means for interrupting the operation of said computer for causing said computer to be in communication with said modem, when said control means causes said switch means to be in the second position;

whereby said computer being in communication with said apparatus.

4,578,538

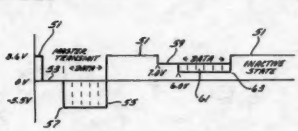
METHOD AND APPARATUS FOR COMMUNICATING DIGITAL SIGNALS OVER TELEPHONE LINES

Gregory A. Pascucci, Waukesha, and Paul G. Kucharski, Franklin, both of Wis., assignors to Johnson Service Company, Milwaukee, Wis.

Filed May 16, 1984, Ser. No. 610,963

Int. Cl.[4] H04M *11/00*; H04Q *1/38*

U.S. Cl. 179—2 DP **12 Claims**



1. A method for effecting the communication of digital signals over telephone lines and including the steps of:

generating a voltage at a first level for providing an inactive state signal directed to a plurality of slave transceiver units;

generating a voltage at a second level for providing a first carrier detect signal directed to said slave units;

generating a digitally-encoded first data signal directed to said slave units and having a peak amplitude at a third voltage level;

generating a voltage at a fourth level for providing a second carrier detect signal to a master transceiver unit, and;

generating a digitally-encoded second data signal having a peak amplitude at a fifth voltage level and directed to said master transceiver unit.

4,578,539

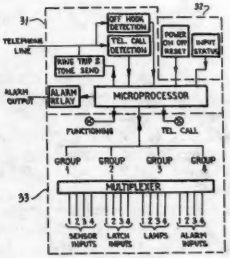
INTERROGATION DEVICE

Leslie C. Townsing, Victoria, Australia, assignor to Remote Interrogations Pty. Ltd., Victoria, Australia

Filed Aug. 10, 1983, Ser. No. 521,667

Int. Cl.[4] H04M *11/04*

U.S. Cl. 179—2 A **10 Claims**



1. An interrogation unit for connecting into an installation via sensing elements connected to sense required information in the installation, said interrogation unit having signal supplying means for supplying signals indicative of the condition of each of various sensors in the installation, and trigger circuit means activatable upon recipt of a request signal to transmit said signals for each of the sensors in turn, said signal supplying means including tone generating means which generates two different tones and being connected to either transmit said tones or not to transmit said tones, whereby to indicate that

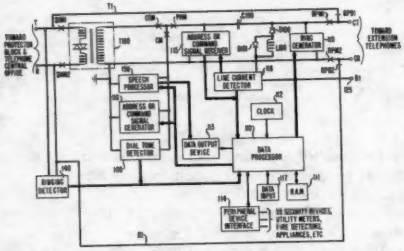
any particular sensor has changed from its initial condition or not, a first of said tones being used for identifying a group of sensors whilst the second of said tones being used for identifying particular sensors in that group.

4,578,540

TELECOMMUNICATIONS SYSTEMS

Kevin E. Borg, Indianapolis; William P. Halas, Carmel; Hans G. Mattes, Indianapolis; Paul M. McLear, Carmel, and Lester L. White, Indianapolis, all of Ind., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 20, 1982, Ser. No. 451,235
Int. Cl.[4] H04M *11/00, 1/00*
U.S. Cl. 179—2 A **17 Claims**



1. A telecommunications system for connection to a telephone network

CHARACTERIZED BY

means for intercepting telephone calls to and from the telephone network, the intercepting means connected between the telephone network and a single pair of conductors to which one or more telephone station sets are connected in parallel, the station sets having signal generating means, said intercepting means comprising

means for receiving address and command signals from the telephone station sets over the single pair of conductors,

data processing means responsive to the address of command signals receiving means,

means responsive to said data processing means for controlling the connection of the telephone station sets to the telephone network, and

means for powering the telephone station sets.

4,578,541

TELEPHONE LINE INTERFACE CIRCUIT

David E. Dodds, Saskatoon, Canada, assignor to Danby Systems Ltd., Saskatoon, Canada

Filed Oct. 24, 1983, Ser. No. 544,952
Claims priority, application Canada, Aug. 26, 1983, 435476
Int. Cl.[4] H04M *3/02, 19/02*
U.S. Cl. 179—18 FA **27 Claims**

1. An interface circuit for providing power and signal voltages to a transmission line, said interface circuit comprising:

first and second terminal means respectively for connecting the circuit to the TIP and RING wires of a transmission line;

capacitance means connected with said terminal means;

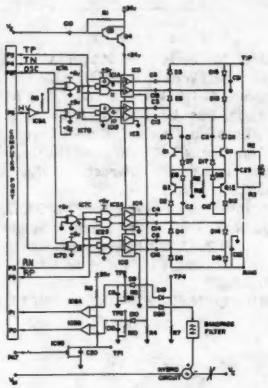
charge pump means for charging said capacitance means, said charge pump means including:

a first diode means; a second diode means having first and second leads;

and first and second isolating capacitor means each including an input side lead and a line side lead, said line side lead of said first isolating capacitor means being connected with said first lead of said second diode means and said line side lead of said second isolating capacitor means being connected with said second lead of said second diode means;

said first diode means being connected in series with said first lead of said second diode means, said first and second diode means being connected in series between said first and second terminal means for permitting passage of current in one direction between said first and second terminal means;

driving voltage means for alternately applying positive and negative voltage differences between said input side lead



of said first isolating capacitor means and said input side lead of said second isolating capacitor means; and

a controlling means for controlling said driving voltage means, said controlling means comprising:

mode control means for starting and stopping application of said alternating positive and negative voltage differences and

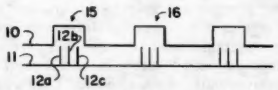
modulating means for modulating said alternating positive and negative voltage differences in response to an input signal.

4,578,542

LINE POWERED FLASHER CIRCUIT FOR RINGING SIGNAL

Robert J. Alderman, 3406 G-7 Ranch Rd., Ruskin, Fla. 33570

Filed May 7, 1984, Ser. No. 607,784
Int. Cl.[4] H04M *11/02*
U.S. Cl. 179—84 L **11 Claims**



1. A telephone line powered flasher circuit responsive to a ringing signal on said telephone line comprising in combination:

coupling and rectification means having a characteristic first time constant connected to said telephone line, including means capacitively coupling a diode rectifier to said telephone lines for charging a storage capacitor in response to the provision of said ringing signal on said telephone line;

a gas-filled light-emitting tube connected to said storage capacitor;

triggering means connected to said gas-filled light-emitting tube and said storage capacitor for causing said tube to conduct in response to said charging of said storage capac-

itor, said triggering means including a pulse transformer having a secondary winding connected to said tube and a primary winding connected to a switching device, said switching device being triggered by the presence of a predetermined voltage at a first point; and

a resistance-capacitance circuit, characterized by a second time constant, connected to said first point and to said storage capacitor for controlling the rate of change of voltage at said first point, said second time constant being at least five times greater than said first time constant;

whereby said tube is caused to flash in response to said provision of said ringing signal on said telephone line.

4,578,543

DIGITAL ECHO CANCELLER

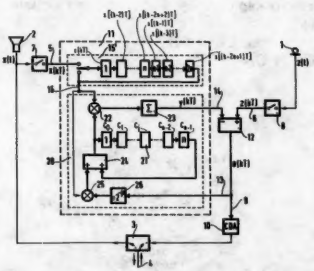
Jean Le Bourlot, Saint-Cheron, and Michel Lévy, Gometz-la-Ville, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Dec. 20, 1982, Ser. No. 451,227

Claims priority, application France, Dec. 23, 1981, 81 24077

Int. Cl.⁴ H04B *3/20*

U.S. Cl. 179—170.2 **3 Claims**



1. A digital echo canceller for use in telephone equipment having first and second channels such that an originating telephone signal x(t) on the first channel is capable of giving rise to a real echo telephone signal z(t) on the second channel, the telephone signals being base band telephone signals, the canceller comprising an adaptive filter for generating a synthetic echo signal y(t) from the originating signal x(t), and means for combining the real echo signal z(t) and the synthetic echo signal y(t) to substantially cancel the real echo signal, thereby leaving a residual echo signal e(t), said adaptive filter adapting itself in such a manner as to minimize the correlation between the originating signal x(t) and the residual echo signal e(t) and comprising processor means and a non-recursive time domain transversal filter constituted by a delay line with intermediate tapping points, said adaptive filter receiving successive signal samples derived by sampling the originating signal x(t) at a sampling rate of 1/T, and being arranged during each sampling period T to weight samples available at said tapping points using a set of weighting coefficients, to sum the weighted samples to produce a sample of the synthetic echo signal y(t), and to update the weighting coefficients; wherein said tapping points along the delay line are separated by a unit time interval which is equal to twice the sampling period T.

4,578,544

INITIALIZATION DEVICE FOR ECHO CANCELLING DEVICE AND APPLICATION THEREOF TO REMOTE ECHOS

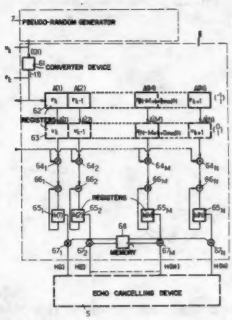
Jean-Marc M. Colin de Verdiere, Paris, and Patrice R. Langlois, Saint Maur, both of France, assignors to Societe Anonyme de Telecommunications, Paris, France

Filed Dec. 6, 1982, Ser. No. 447,242

Claims priority, application France, Dec. 9, 1981, 81 22984

Int. Cl.⁴ H04B *3/20*

U.S. Cl. 179—170.2 **2 Claims**



1. Initialization device for adaptative echo cancelling device, said adaptative echo cancelling device comprising a transversal filter with N coefficients and means for constantly updating said N coefficients after said initialization device has provided initial values of said N coefficients, said echo cancelling device being connected in shunt with an echo path between an emission line and a reception line, said initialization device having a first output connected to said emission line, N outputs connected to said echo cancelling device, a first input connected to said reception line and a second input connected to a pseudo random generator providing a sequence of N binary samples $u_1 \ldots u_k, \ldots u_n$, said initialization device comprising:

first converting means connected between said second input and said first output for deriving a sample e_k from every binary sample u_k by the relation:

$$e_k = 2u_k - 1$$

a shift register, connected to the output of said first converting means, and comprising N cells

$$A(1), \ldots A(M), \ldots A(N)$$

to store

$$e_k, \ldots, e_{(N-M+k+1) \text{ modulo } N}, \ldots, e_{k+1}$$

every cell being provided with one output,

a set of N second converting means connected to said outputs of said cells, for deriving a sample $u_{(N-M+k+1) \text{ modulo } N}$ from every sample $e_{(N-M+k+1) \text{ modulo } N}$ stored in every said cell A(M), by the relation:

$$u_{(N-M+k+1) \text{ modulo } N} = (e_{(N-M+k+1) \text{ modulo } N+1})/2$$

a set of N multipliers, ever multiplier having one input connected to said reception line, and another input connected to an output of one of said N second converting means,

a set of N addition circuits, every addition circuit having a first input connected to an output of one of said N multipliers,

a set of N registers, every register having an input connected

an output of one of said N addition circuits, and an output connected to another input of said one of said N addition circuits, and to one of said N outputs of said initialization device.

4,578,545

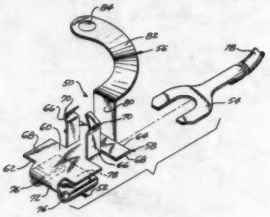
CONTACT AND TERMINAL FOR TELEPHONE TRANSMITTER

Walter M. Phillipson, Woodside, N.Y., assignor to Stewart Stamping Corp., Yonkers, N.Y.

Filed May 3, 1984, Ser. No. 606,899

Int. Cl.[4] H01R *4/00, 9/00*

U.S. Cl. 179—178 **18 Claims**



1. An electrical contact and terminal device adapted to be affixed to a transmitter cup of a telephone handset for effecting electrical coupling between a transmitter contact and a conductor terminal, the transmitter cup including a base wall in which at least one opening is formed and a peripheral side wall, comprising:

a fastening portion including a substantially planar base portion having opposed first and second edges and a pair of ears integrally extending from said planar base portion and forming substantially right angles therewith;

a contact portion integrally extending from said first edge of said planar base portion, said contact portion including a first straight portion integrally extending from said first edge of said planar base portion and forming a substantially right angle therewith and a second portion integrally extending from said first straight portion and forming an angle with a plane parallel to said planar base portion;

a connector portion integrally extending from said second edge of said planar base portion including means for electrically engaging the contact terminal of the conductor; and wherein

said device is formed of a single piece of conductive sheet metal.

4,578,546

ELECTRIC TRACTION CURRENT-COLLECTOR

Ian C. Ferguson, Swansea, Wales, assignor to Morganite Electrical Carbon Limited, Swansea, Wales

PCT No. PCT/GB82/00300, § 371 Date Jun. 20, 1983, § 102(e) Date Jun. 20, 1983, PCT Pub. No. WO83/01419, PCT Pub. Date Apr. 28, 1983

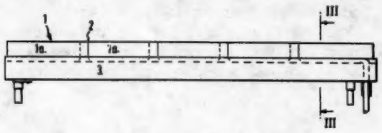
PCT Filed Oct. 21, 1982, Ser. No. 514,803

Claims priority, application United Kingdom, Oct. 22, 1981, 8131912

Int. Cl.[4] B60L *5/20, 5/32, 5/14*

U.S. Cl. 191—87 **3 Claims**

1. In a carbon current-collector block being a component of means for contacting and collecting electric power from a railway power conductor, said block comprising means housing a tubular contrainer for fluid, means for fluid connection of said container to carrier means for said block, said carrier means being operable by fluid pressure to maintain said block in contact with the conductor or to effect retraction of the block from the conductor on occurrence of change of fluid condition within the container due to rupture thereof; the improvement comprising the provision of a tubular container which is distensible to bursting under a given pressure of fluid supplied through said fluid connection means, said fluid connection means being substantially non-distensible at said given fluid pressure and being connected to said container within said housing means so that no distensible part of said container extends outside said housing, and said housing means forming a complete support and enclosure of said container, limiting



distention of said container within said housing means and preventing bursting of said container only if and so long as said support thereof is complete, such that a construction or assembly fault, a crack or other incipient failure or other defect in complete support results in bursting of the container and retraction of the block from the conductor without requiring rupture of the container directly by the conductor or some other agency.

4,578,547

ELECTRIC SWITCH

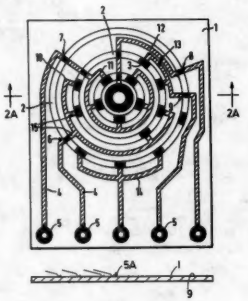
Horst H. Günther, Ansbach, and Hermann F. Oesterle, Lauf, both of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Oct. 1, 1984, Ser. No. 656,700

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1983, 3336130

Int. Cl.[4] H01H *19/54, 9/00*

U.S. Cl. 200—11 DA **5 Claims**



1. A printed circuit board for an electric switch and comprising:

conductors printed on said board and being coated with a layer of a noble material so as to form fixed contacts coacting with associated switch moving contacts;

said fixed contacts being intermittently disposed along predetermined contact paths on said circuit board;

said fixed contacts being linked and intersected by connecting conductors spaced apart from and linearly following substantial positions of said contact paths.

5. A printed circuit board for an electric switch and comprising:

conductors printed on said board and being coated with a layer of noble material as to form fixed contacts coacting with associated switch moving contacts;

said fixed contacts being intermittently disposed along predetermined contact paths on said circuit board;

said fixed contacts linked by connecting conductors spaced apart from said contact paths;

the fixed contacts connected to said corresponding connecting conductors by link webs radially extending and intersecting said contact paths, and forming fixed contacts at intersections with said paths;

said fixed contacts and said connecting conductors located along substantially concentrical paths;

said connecting conductors covered by a layer of said noble metal at intersections with said contact paths.

4,578,548

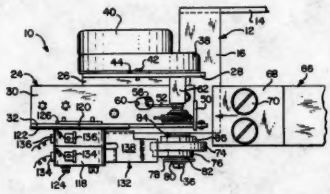
SWITCHING DEVICE FOR A COIN CONTROLLED MACHINE

Harry Greenwald, Whitestone, and Pierre Lier, Wantagh, both of N.Y., assignors to Kidde, Inc., Clifton, N.J.

Filed Oct. 31, 1984, Ser. No. 666,687

Int. Cl.[4] H01H *7/00*

U.S. Cl. 200—38 F **23 Claims**



1. A switching device for a coin controlled machine in which the switching device is actuated in response to completion of a predetermined number of cycles of an operator means, the switching device comprising:

a machine activating switch having an operative state and an inoperative state;

a homing switch having an operative state and an inoperative state, said homing switch when in its operative state serving to return said machine activating switch to its inoperative state;

a shaft rotatably mounted and disposed for rotation a first predetermined angular increment each time the operator means cycles;

a first switch actuating mechanism operatively coupled to said shaft for actuating said machine activating switch, said first mechanism advancing a second predetermined increment upon each angular incremental rotation of said shaft, said first mechanism advancing from an initial inoperative position to an actuation position, the number of second predetermined increments between said initial inoperative position and said actuation position being selectable;

a second switch actuating mechanism operatively coupled to said shaft for actuating said homing switch, said second mechanism advancing from an initial inoperative position to an actuation position upon rotation of said shaft;

the initial inoperative position of one of said first and second switch actuating mechanisms being adjustable relative to the initial inoperative position of the other one of said switch actuating mechanisms;

whereby the selection of the number of second predetermined increments will determine the number of first predetermined increments required to advance said first switch actuating mechanism to its actuation position thereby requiring a corresponding number of cycles of the operator means to effect activation of the coin controlled machine.

4,578,549

SNAP ACTION ELECTRICAL SWITCH

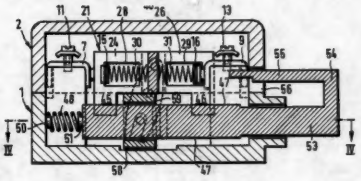
Heinz Grunst, and Heinz Kleine, both of Marienheide, Fed. Rep. of Germany, assignors to Square D Starkstrom GmbH, Marienheide, Fed. Rep. of Germany

Filed Aug. 29, 1984, Ser. No. 645,845

Claims priority, application European Pat. Off., Sep. 8, 1983, 83 108849.7

Int. Cl.[4] H01H *15/18*

U.S. Cl. 200—76 **21 Claims**



1. A snap-action switch, particularly for end switches or limiting keys, comprising a housing; a support; two contact bridges carrying contacts and being movably guided in said support; stationary contacts; means for displacing said support and said contact bridges; said displacing means, said support, said contact bridges and said stationary contacts being accommodated in said housing; an actuating push rod; and spring-elastic means interconnected between said push rod and said displacing means, said push rod being connected to said spring-elastic means and actuated and displaced from outside of said housing in two opposite directions so as to displace said contact bridges by said spring-elastic means, said displacing means and said support toward and away from said stationary contacts, said displacing means displacing said contact bridges during the switching such that the direction of the displacement of said contact bridges corresponds to the direction of the displacement of said push rod; said displacing means including two double-armed levers positioned in said housing and cooperating with said support for reversing the direction of displacement of said contact bridges.

4,578,550

ELECTRICAL, MEDIUM VOLTAGE, SWITCHING MECHANISM

Arnold Efinger, Trossingen, Fed. Rep. of Germany, assignor to Wickmann-Werke Böblingen GmbH, Böblingen, Fed. Rep. of Germany

Filed Nov. 29, 1984, Ser. No. 676,070

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1983, 3343099

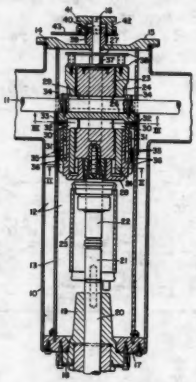
Int. Cl.[4] H01H *33/66*

U.S. Cl. 200—144 B **9 Claims**

1. An electrical, medium voltage, switching mechanism, which includes a casing having a gaseous or liquid insulating material filling; in said casing, between a cable connection and a bus bar, a change-over switch, which can alternately switch between a phase contact and a ground contact, follows a load disconnector, which is in the form of a vacuum switching tube, and has a fixed contact piece and an axially movable cooperating contact piece;

the improvement comprising a common actuating element for both said load disconnector and said change-over

switch, said actuating element being in the form of an axially displaceable shaft which is displaceable relative to



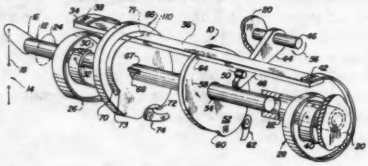
said load disconnector and is rotatable relative to said change-over switch.

4,578,551

OPERATING MECHANISM FOR ELECTRICAL SWITCHES

Chester H. Lin, Skokie, Ill., assignor to S&C Electric Company, Chicago, Ill.

Filed Apr. 10, 1985, Ser. No. 721,613
Int. Cl.[4] H01H *3/00*
U.S. Cl. 200—153 SC **28 Claims**



1. An operating mechanism for an electrical switch, the operating mechanism being capable of immediately reopening the switch after its closure, the operating mechanism comprising:

a frame;

a carriage movable between first and second positions;

a switch operating member to effect opening and closing of a switch and being movable between respective first and second positions;

switch-closing energy storage means acting between said switch operating member and said carriage for storing switch-closing energy;

switch-opening energy storage means acting between said carriage and said frame for storing switch-opening energy;

first selectively releasable latch means for selectively preventing switch-closing movement of said switch operating member whenever the switch is open;

second selectively releasable latch means for selectively preventing movement of said carriage from said second position to said first position, said carriage being moved from said first position to said second position to store energy in said switch-closing energy storage means and said switch-opening energy storage means while said switch operating member is latched by said first selectively releasable means in said first position corresponding to the switch-open position, said carriage being latched by said second selectively releasable latch means when said carriage reaches said second position, subsequent release of said switch operating member by said first selectively releasable latch means causing said switch operating member to move from said first position to said second position corresponding to the switch-closed position, subsequent release of said carriage by said second selectively releasable latch means causing said carriage to move from said second position to said first position; and

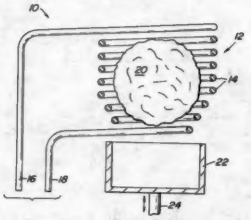
means for moving said switch operating member from said second position to said first position in response to movement of said carriage from said second position to said first position.

4,578,552

LEVITATION HEATING USING SINGLE VARIABLE FREQUENCY POWER SUPPLY

John H. Mortimer, Medford, N.J., assignor to Inductotherm Corporation, Rancocas, N.J.

Filed Aug. 1, 1985, Ser. No. 761,271
Int. Cl.[4] H05B *6/32*
U.S. Cl. 219—10.41 **6 Claims**



1. A system for magnetically levitating and inductively heating a workpiece, comprising

(a) a single coil for simultaneously levitating and heating the workpiece,

(b) a single variable frequency alternating-current power supply in circuit with the coil to supply power for both levitation and heating to the coil,

(c) means for varying the frequency of the power supply output to vary the heating effect on the workpiece,

(d) means in series with the coil for varying the apparent impedance of the coil as the frequency of the power supply output is varied to provide a constant current amplitude in the coil independent of said frequency to maintain a constant levitation force on the workpiece, and

(e) feedback and control means for maintaining the amplitude of the power supplied to the coil at a constant value.

4,578,553

MULTI-UNIT INDUCTION HEAT COOKING APPARATUS HAVING A COMMON NOISE REJECTION FILTER

Hidekazu Yamashita, Osaka, and Hideyuki Kominami, Takatsuki, both of Japan, assignors to Matsushita Electric Industrial Company, Limited, Japan

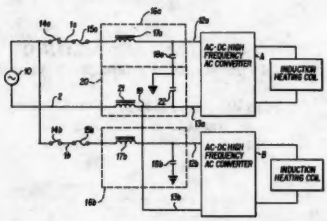
Filed Apr. 27, 1983, Ser. No. 488,523
Claims priority, application Japan, Apr. 28, 1982, 57-72120
Int. Cl.[4] H05B *1/02, 6/06, 6/64*
U.S. Cl. 219—10.77 **5 Claims**

1. An induction heat cooking apparatus comprising:

a plurality of converters for generating high frequency energy, each of said converters having first and second input terminals, said first input terminals being coupled respectively through first circuits to a first terminal of a low frequency power source, said second input terminals being coupled together to a common circuit node which is

connected through a second circuit to a second terminal of said power source;

a like plurality of manually operated switches respectively connected in said first circuits;



a like plurality of first high frequency noise rejection filters connected respectively in said first circuits; and

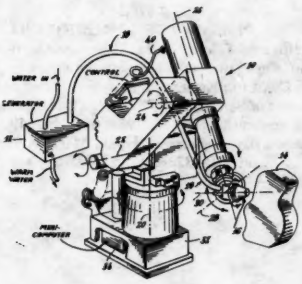
a second high frequency noise rejection filter connected in said second circuit.

4,578,554

LASER WELDING APPARATUS

Leland E. Coulter, New Canaan, Conn., assignor to Teledyne, Inc., New Canaan, Conn.

Filed Apr. 30, 1984, Ser. No. 605,279
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121 LC **18 Claims**



1. A laser welding apparatus, comprising:

a base;

a welding head mounted on the base for movement about a plurality of axes;

laser generating means;

optical fiber transmission means for transmitting a laser beam from the laser generating means to the welding head for emission therefrom, the optical fiber transmission means being rotatably mounted on the welding head for free rotation about the axis of the emitted laser beam so as to reduce torsion of the optical fiber transmission means when the welding head is moved; and

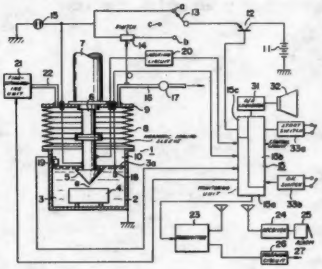
focusing means on the welding head for focusing the laser beam to a focal point.

4,578,555

FAIL-SAFE MACHINE TOOL OPERATIONAL SETTING SYSTEM WITH PRERECORDED VERBAL INSTRUCTIONS

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Inc., Kanagawaken, Japan

Filed Nov. 1, 1982, Ser. No. 438,286
Claims priority, application Japan, Oct. 30, 1981, 56-172833
Int. Cl.[4] B23P *1/08;* **G05B** *9/02;* **G06F** *3/16;* **G08B** *21/00*
U.S. Cl. 219—695 **4 Claims**



1. A machine tool operable automatically to machine a workpiece, comprising:

(a) a plurality of complementary functional machine components which the operator prior to initiation of a given machining operation is required to set into their respective prescribed operating positions through at least a like plurality of different, predetermined manual setting procedures, to enable said machine tool to establish a predetermined operating mode and to properly operate in said mode automatically for machining the workpiece during said given machining operation; and

(b) a fail-safe mechanism for aiding the operator in finishing said different, predetermined manual setting procedures properly and without fail, the mechanism (b) comprising:

(b') an audio system associated with said machine tool and including a loudspeaker for emitting in a preselected sequence different, prescribed verbal signals corresponding at least one by one to said different, predetermined manual setting procedures and audible to the operator, thereby alerting the operator to said different, predetermined manual setting procedures one by one in said sequence;

(c) manual switch means actuatable by the operator upon his listening to one of said verbal signals and thereafter upon his checking and verification of a corresponding one of said setting procedures as done in said prescribed sequence to produce a verification signal therefor; and

(d) circuit means for supplying into said audio system said verification signal to allow said loudspeaker to emit a next one of said verbal signals in said preselected sequence and thereby to permit the operator to be alerted as to a corresponding next one of said setting procedures in said preselected sequence.

4,578,556

EDM METHOD AND APPARATUS UTILIZING WATER VAPOR

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohamashi, Japan

Continuation of Ser. No. 405,076, Aug. 4, 1982. This application Jul. 30, 1984, Ser. No. 636,062
Int. Cl.[4] B23P *1/08, 1/16*
U.S. Cl. 219—69 M **2 Claims**

1. A method of machining a conductive workpiece which comprises the steps of:

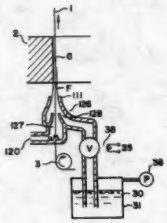
(a) spacedly juxtaposing a traveling tool electrode with an

electrically conductive workpiece to define a machining gap therebetween;

(b) passing said tool electrode in succession coaxially through an inner nozzle and an outer nozzle into which said inner nozzle opens before said traveling electrode is juxtaposed with said workpiece to define said gap, said outer nozzle being axially trained on said gap;

(c) generating water vapor by heating a body of liquid water;

(d) introducing said water vapor into said inner nozzle whereby said water vapor contacts said electrode before said electrode enters said outer nozzle;



(e) injecting water vapor from said inner nozzle into said outer nozzle to induce suction in said outer nozzle and entrain liquid water from a source other than said water vapor into said outer nozzle for admixture with said water vapor in said outer nozzle and discharging of the resulting mixture of said water vapor and liquid water into said gap as a machining liquid;

(f) passing a succession of electrical pulses across said gap between said electrode and said workpiece to electroerosively remove stock from said workpiece; and

(g) relatively displacing said tool electrode and said workpiece in a direction generally transverse to a direction of travel of said tool electrode to advance the electroerosive stock removal of said workpiece.

4,578,557

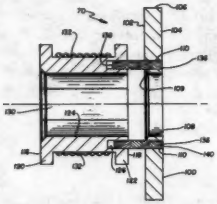
LIQUID STABILIZED PLASMA BURNER HAVING FLEXIBLE CATHODE HOLDER

Trueman D. Turner, Rockwood, Mich., assignor to Plasmafusion, Inc., Wyandotte, Mich.

Filed Jan. 4, 1985, Ser. No. 688,957

Int. Cl.[4] B23K *9/00*

U.S. Cl. 219—121 PP **20 Claims**



1. A cathode holder for facilitating the flexible guidance and support of a cathode element of a liquid plasma stabilized plasma burner comprising:

an electrically conductive plate containing a centrally disposed aperture adapted to permit passage of the cathode therethrough;

a plurality of electrically conductive segments flexibly connected together to form a cylinder easily receivable and flexibly supportive of the cathode element, said cylinder including a bore adapted to permit passage of the cathode therethrough; and

a mounting means for flexibly mounting said cylinder to said plate.

4,578,558

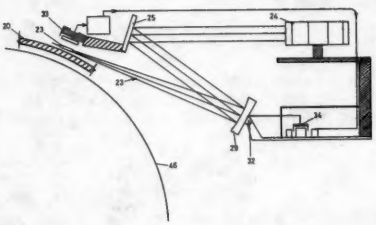
LASER MEANS AND METHOD

John E. Clegg, 26 Sheoak Rd., Crafers, South Australia, Australia

Filed Jan. 23, 1984, Ser. No. 573,068

Int. Cl.[4] B23K *27/00*

U.S. Cl. 219—121 LG **15 Claims**



1. Means for severing fibre from the skin of a fell, comprising:

a conveyor means arranged to convey the fell in a longitudinal direction,

a laser,

focusing means spaced from the laser and so arranged with respect to the laser and the conveyor means as to focus the laser beam on to the fibre adjacent the skin when the fell is on the conveyor means, and

scanning means associated with the laser and its focusing means and operable to scan the focused laser beam in a traversing movement along a cutting line.

4,578,559

PLASMA ETCHING METHOD

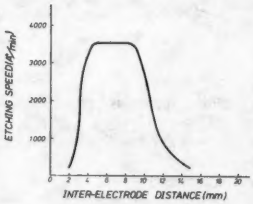
Isamu Hijikata, Tokyo; Akira Uehara, and Hisashi Nakane, both of Kanagawa, all of Japan, assignors to Tokyo Ohka Kogyo Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 424,289, Sep. 27, 1982, abandoned. This application Sep. 10, 1984, Ser. No. 649,164

Claims priority, application Japan, Mar. 10, 1982, 57-38807

Int. Cl.[4] B23K *9/00*; H01L *21/306*

U.S. Cl. 219—121 PE **10 Claims**



1. A plasma anisotropic etching method employing a parallel-plate type plasma etching device which comprises a reaction chamber, a substantially plate-like ground electrode and a substantially plate-like counter electrode both disposed in parallel with each other within said reaction chamber, the method comprising the steps of:

placing a material to be etched on said ground electrode;

carrying out an electric discharge with a spacing (s) between both said electrodes such that the spacing (s) is greater than 3 mm and no greater than 10 mm (i. e., 3 mm $\leqq S < 10$ mm); and

the plasma anisotropic etching is carried out with the same treating gases, pressure and radio-frequency power as in a plasma isotropic etching.

4,578,560

HIGH FREQUENCY INDUCTION COUPLED PLASMA TORCH WITH CONCENTRIC PIPES HAVING FLANGES THEREON

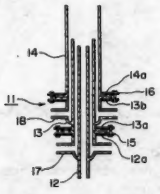
Gotaro Tanaka; Kunio Fujiwara, and Tetsuo Miyajiri, all of Kanagawa, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Sep. 16, 1983, Ser. No. 532,937

Claims priority, application Japan, Sep. 17, 1982, 57-139953[U]

Int. Cl.⁴ B23K *9/00*

U.S. Cl. 219—121 PR **18 Claims**



1. A high frequency induction coupled plasma torch employing a concentric pipe assembly passing plasma gas therethrough and generating a plasma flame at one end of said pipe assembly, said pipe assembly comprising,

at least first and second cylindrical pipes;

said first pipe comprising an elongated cylindrical portion and an outer portion extending from said elongated cylindrical poriton near a base of said first cylindrical pipe, said outer portion terminating in a flanged opening having a flange surrounding but not in contact with said first cylindrical pipe;

said second pipe comprising an elongated cylindrical portion terminating in an outward bottom flange at the end opposite the end at which a flame is generated;

the elongated cylindrical portion of said first pipe being inside and coaxial with the elongated cylindrical portion of said second pipe, and said flange of said first pipe mating and being fastened to said outward bottom flange of said second pipe; and

clamping means for fastening together said flange of said first pipe and said outward bottom flange of said second pipe, said clamping means permitting adjustment of the relative positions of said first and second pipes.

4,578,561

METHOD OF ENHANCING WELD POOL BOUNDARY DEFINITION

Nelson R. Corby, Jr., Scotia, and Stanley J. Godwin, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 16, 1984, Ser. No. 641,541

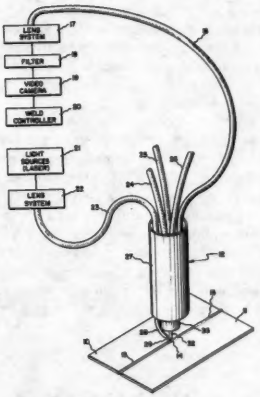
Int. Cl.⁴ B23K *9/12*

U.S. Cl. 219—124.34 **3 Claims**

1. In a robotic arc weding operation wherein a convex-surfaced molten weld pool is created in a workpiece by the heat of an electric arc and is viewed by an optical vision system on a welding torch to guide the torch and control the welding process, the method of improving the solid/liquid boundary definition in an image for computer analysis comprising:

imaging light from a narrowband light source onto the entrance of a coherent optical fiber bundle whose exit end and an output lens system are mounted on said welding torch and which reimages light exiting said bundle to floodlight and iluminate only the surface of said weld pool and adjacent workpiece surface, incident light being introduced at an angle thereto;

said weld pool having a specular surface and reflecting almost all of the incident light away from said optical vision system, the workpiece having a rough surface and diffusely reflecting light, an appreciable fraction of which is collected by said optical vision system; and



producing said image in which said weld pool is dark and the floodlighted workpiece surface is bright and the continuous pool boundary is clearly defined;

said narrowband light source comprising two low power lasers generating narrow light beams that are imaged by an input lens system as dots on the entrance of said optical fiber bundle and reimage by said output lens system as magnified oval-shaped spots onto the side edges of said weld pool and adjaccent workpiece surfaces.

4,578,562

METHOD AND CONTROL SYSTEM FOR CONTROLLING AN INDUSTRIAL ROBOT

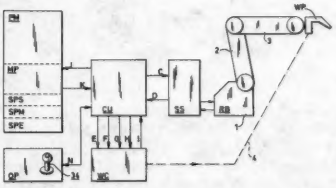
Lars Lindström, Västerås, and Kent Nilsson, Laxå, both of Sweden, assignors to ASEA AB, Västerås, Sweden

Filed Apr. 4, 1984, Ser. No. 596,605

Claims priority, application Sweden, Apr. 8, 1983, 8301964

Int. Cl.⁴ B23K *9/12*

U.S. Cl. 219—125.1 **12 Claims**



1. A method of controlling a work process carried out on an object with the aid of an industrial robot during relative movement between the object and the robot, robot instructions being stored both with regard to positioning by means of the robot of process equipment relative to the object, and with

regard to the process to be carried out, the work process being carried out by the robot executing the stored instructions, comprising the steps of:

storing process instructions in the form of process stage instructions including

(a) a process start stage, during which the process is initiated and relative movement between the object and the robot can be started,

(b) a process main stage, during which the work process is carried out, and

(c) a process terminal stage, during which the process is terminated and relative movement between object and robot can be stopped;

storing for the respective process stages permanent instructions relating to the implementation of the process stage in the form of parameters which are to be brought into action and in which order the activation is to take place, and also storing for the respective process stages instructions or sets relating to specific data of at least some of said process parameters; and

modifying at least one instruction or set relating to specific data or levels of at least some of the process parameters, said modifying step utilizing an analog multifunction operating means having motion in at least two dimensions, wherein each dimension is assigned a particular one of said process parameters, the value of the stored instruction being modified for the associated process parameter in response to operation of said operating means.

2. The method of claim 1, wherein the work process is arc welding, and wherein the specific process parameters include at least two of welding voltage, welding current, and welding speed.

4,578,563

STEAM GENERATOR

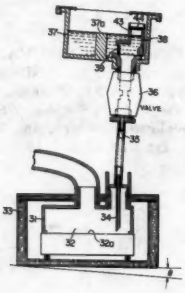
Kenzo Eguchi, and Jiro Kobayashi, both of Tokyo, Japan, assignors to Taishin Electric Ind. Co., Ltd. and Toshiba Medical Supply Co., Ltd., both of Tokyo, Japan

Filed Oct. 12, 1984, Ser. No. 660,509

Claims priority, application Japan, Oct. 25, 1983, 58-163956[U]; Oct. 25, 1983, 58-163957[U]; Oct. 25, 1983, 58-163958[U]; Oct. 25, 1983, 58-163959[U]

Int. Cl.⁴ F22B *27/00*

U.S. Cl. 219—273 **6 Claims**



1. A steam generator comprising:

water supply means for continuously supplying a small amount of water;

a vapor assembly having an inlet port for receiving water from said water supply means, a heat-conductive vapor chamber for sequentially heating and vaporizing water from said water supply means, and a drain port for discharging steam;

a heater for heating said vapor assembly, and a heat-insulating cover for surrounding said vapor assembly and said heater; and

said water supply means including a dust remover, arranged in a tank support for mounting a cartridge type water tank, for filtering water supplied to said vapor chamber, said dust remover being provided with a filtering material for filtering water at a side surface thereof immersed in water in said tank support, and a projection opening to remove a bubble reversely flowing from said vapor chamber.

4,578,564

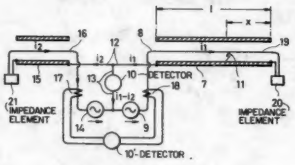
SERIES-CONNECTED, SKIN-CURRENT HEATING PIPE INCLUDING CURRENT TROUBLE DETECTOR

Masao Ando, Yokohama, Japan, assignor to Chisso Corporation, Tokyo, Japan

Filed Sep. 5, 1984, Ser. No. 647,474

Int. Cl.⁴ H05B *1/02, 3/00*; F16L *53/00*

U.S. Cl. 219—301 **16 Claims**



1. A series-connected, skin-current heating pipe circuit comprising:

(a) a first ferromagnetic pipe;

(b) a first insulated wire extending along and inside said first ferromagnetic pipe;

(c) a first a.c. source connected to one end of each of said first ferromagnetic pipe and said first insulated wire;

(d) a first impedance element connected between the other end of each of said first ferromagnetic pipe and said first insulated wire; and

(e) a current trouble detecting means provided in either line connecting said first a.c. source to said respective first ends of said first ferromagnetic pipe and said first insulated line to detect a current trouble due to an insulating trouble at any point of said first insulated wire.

4,578,565

COMBINED ELECTRIC HEATING AND WATER INLET/OUTLET ASSEMBLY FOR WATER HEATING TANKS

Shmuel Dawidowitch, 304 Hayarkon St., Tel Aviv, Israel

Filed Dec. 5, 1984, Ser. No. 678,460

Claims priority, application Israel, Dec. 7, 1983, 70402

Int. Cl.⁴ H05B *1/02, 3/82*

U.S. Cl. 219—314 **9 Claims**

1. A combined heating and water inlet/outlet assembly for domestic electric water heater tanks having a circular bottom opening surrounded by a series of gudgeon bolts for fastening thereto an electric element mounting flange, comprising

(a) a first, integrally formed unit having a circular flange adapted to cover the tank opening and provided with circumferentially spaced openings adapted to receive the tank gudgeons;

(b) an open-top cylindrical sleeve having its bottom closed by and extending upwardly from a central section of the flange, which sleeve is adapted to be inserted through the tank opening into the interior of the tank;

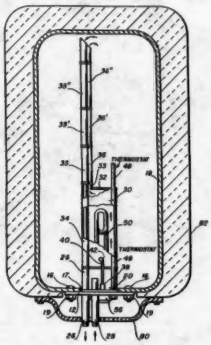
(c) a tapped opening in said central portion threadably receiving a plug member carrying an electric immersion-type heating element extending upwardly into said sleeve with its terminals projecting downwards;

(d) a pair of tubular conduits, adapted to form the water inlet and outlet of the tank, extending upwardly from the said flange each along an outer generatrix of the said sleeve,

and downwards of the flange, for connecting thereto cold and heated water conduits;

(e) a second, integrally formed unit comprising a closed top cylindrical member seated on top of the said sleeve to form an extension thereof;

(f) a tubular section extending along an outer generatrix of the cylindrical member thus forming an extension of said outlet conduit;



(g) an upwardly extending riser tube section at the closed top of the cylindrical member, forming an outlet for water heated by said heating element;

(h) a series of integrally formed pairs of parallel tube lengths fitting one on top of the other and on top of said tubular outlet and said riser tube section, to form extensions thereof up to the top wall of the tank; and

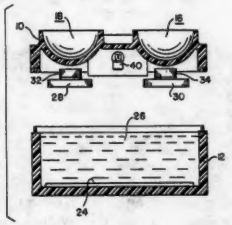
(i) an opening at the wall of the cylindrical member for introducing water thereinto from the interior of the tank.

4,578,566

SOFT CONTACT LENS DISINFECTING UNIT

John G. Bowen, 1144 The Strand, Manhattan Beach, Calif. 90266

Filed May 28, 1985, Ser. No. 738,279
Int. Cl.[4] H05B *3/06*; A61L *2/04*
U.S. Cl. 219—521 **2 Claims**



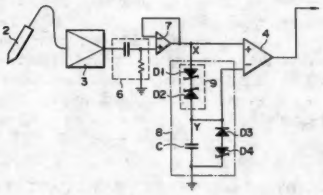
1. An electrically energized heating unit for disinfecting soft contact lenses, and the like, which are normally cleaned by detergents, comprising: a housing of a plastic material immune from surfactant contamination and resulting leakage regardless of the type of detergent used to clean the lenses disinfected by the unit, and said housing having at least one compartment for receiving the soft contact lenses to be disinfected; electrically energized heating means mounted in the housing adjacent to the compartment; and electric circuitry mounted in the housing for connecting the heater means to an energizing source.

4,578,567

METHOD AND APPARATUS FOR GAINING ACCESS TO A SYSTEM HAVING CONTROLLED ACCESS THERETO

Robert H. Granzow, Miamisburg, Ohio; Desh B. Gupta, Elm Grove, Wis., and Kimbrough I. Myers, Kettering, Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Aug. 25, 1983, Ser. No. 526,574
Int. Cl.[4] G06K *5/00*
U.S. Cl. 235—380 **16 Claims**



1. A system having controlled access thereto, comprising:

means for entering first and second identifiers associated with a user of said system;

control means for receiving said first and second identifiers and for issuing a third identifier to said user via said entering means upon a satisfactory evaluation of said first and second identifiers; and

said system having a plurality of entities and also having means for coupling said entities with said control means;

each said entity having means for entering said second and third identifiers associated with said user;

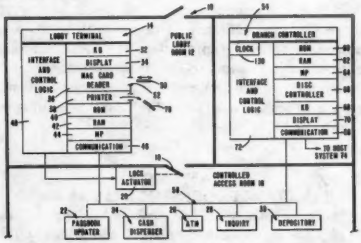
said control means having means for evaluating said second and third identifiers and for issuing a control signal to the associated said entity to enable that said user to gain access to the associated said entity upon a satisfactory evaluation of said second and third identifiers.

4,578,568

DATA READER

Hanzou Tsuzuki, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Oct. 24, 1983, Ser. No. 544,771
Claims priority, application Japan, Oct. 28, 1982, 57-188174
Int. Cl.[4] G06K *7/00*
U.S. Cl. 235—436 **4 Claims**



1. A data reader comprising:

data reading means for reading recorded data from an external recording medium and for producing an analog signal;

a switching circuit having first and second terminals, said first terminal being connected to an output terminal of said data reading means, said switching circuit being turned off when a potential difference between said first terminal and said second terminal falls within a predetermined range and said

switching means being turned on when the potential difference falls outside the predetermined range;

a hold circuit for holding a potential applied thereto, said hold circuit comprising a diode the cathode of whidh is connected to the second terminal of said switching circuit, a Zener diode the anode of which is connected to the anode of said diode and a capacitor parallel-connected between the cathode of said diode and the cathode of said Zener diode; and

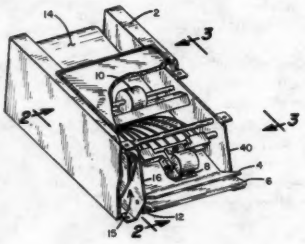
a comparator having a first input terminal connected to a node between said data reading means and said first terminal of said switching circuit and a second input terminal connected to a node between said second terminal of said switching circuit and said hold circuit, said comparator comparing a potential of the analog signal supplied to said first input terminal with a potential held by said hold circuit and supplied to the second input terminal, thereby producing a digital signal.

4,578,569

MULTI-WIDTH CARD READER WITH CANCELLATION FEATURE

Bradley W. Arp, Mound; Ronald O. J. Lindberg, Minneapolis, and Wayne A. Mueller, Mound, all of Minn., assignors to HEI, Inc., Victoria, Minn.

Filed Jun. 20, 1983, Ser. No. 505,903
Int. Cl.[4] G06K 7/10
U.S. Cl. 235—454 **5 Claims**



1. Improved apparatus for reading data containing media including driven means for frictionally grasping and conveying the medium past a reading station whereat the data contained thereon are detected, the improvement comprising:

(a) means including a perforator wheel operatively coupled to said driven means for embossing said data containing medium during the reading thereof and whereby the medium is visually and tactilely cancelled, said perforator wheel having a plurality of raised projections extending outwardly from the circumferential surface thereof and mounted adjacent to a relatively hard surface such that as the medium passes between said projections and said hard surface, at least one surface of the data containing medium is embossed.

4,578,570

BAR CODE PROCESSING APPARATUS

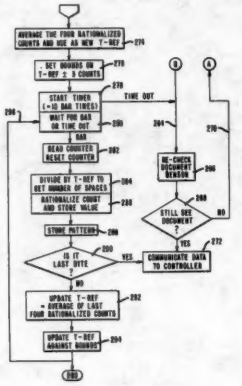
Ali T. Mazumder, Waterloo, and Armand M. Dumas, Kitchener, both of Canada, assignors to NCR CANADA LTD.-NCR CANADA LTEE, Mississauga, Canada

Filed Aug. 14, 1984, Ser. No. 640,895
Int. Cl.[4] G06K 7/10
U.S. Cl. 235—463 **10 Claims**

1. A method for processing a plurality of control signals each representing the sensing of a bar on a coded bar label by a sensing device in which a series of bars and spaces represent a data word comprising the steps of:

generating a first time interval representing the average time of occurrence between a predetermined number of succeeding control signals;

upon the generation of each succeeding control signal, generating a second time interval representing the time of occurrence between the generation of the last control signal and the succeeding control signal;



dividing the second time interval by the first time interval to produce a quotient;

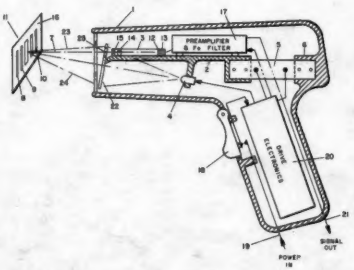
and storing data signals representing the succeeding control signal as a bar when the quotient is a one.

4,578,571

PORTABLE BAR CODE SCANNING DEVICE AND METHOD

Richard E. Williams, Lake Mary, Fla., assignor to Numa Corporation, Lake Mary, Fla.

Filed Nov. 14, 1983, Ser. No. 551,672
Int. Cl.[4] G06K 7/10
U.S. Cl. 235—472 **12 Claims**



1. A device for measuring at a variable throw distance the reflectance of a zone in a bar code symbol, comprising:

a housing normally supportable by a user at said variable throw distance from said symbol;

an optical assembly attached to said housing by coupling means;

a light-emitting diode affixed to said assembly for providing a radiant light beam of constant average energy;

optical condensing means affixed to said assembly for directing said radiant light beam to intersect said zone;

telescope means affixed to said assembly and having a field-of-view falling within the intersection of said radiant beam and said zone: and

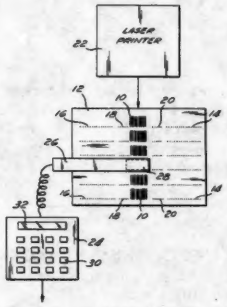
sensor means affixed to said telescope means for detecting the intensity of reflected light within said field-of-view and for generating an electrical signal indicative of said intensity, whereby said signal characterizes said measurement.

4,578,572

MODULAR MICROPROCESSOR-BASED SYSTEM FOR PRINTING AND READING A PERSONAL IDENTIFIER CODE ON A FORM

John R. Hice, Santa Paula, Calif., assignor to Data Information Management Systems, Inc., Ventura, Calif.

Filed Jun. 17, 1983, Ser. No. 505,234
Int. Cl.[4] G06K *7/10*
U.S. Cl. 235—472 **10 Claims**



1. A modular microprocessor-based apparatus for printing a unique personal identifier code on a sheet of paper, which sheet of paper comprises a form adapted for use in the elections process, which code is adapted to enable the person's file to be addressible directly without correlation to a control file, and for enabling the code to be read from the sheet of paper, to generate data associated with the person identified by the code relating to the elections process, for processing thereof for use in the elections process, comprising:

(a) means for printing the unique directly-addressible personal identifier code, assigned to the person upon registration on the elections rolls, on the sheet of elections process form paper, microprocessor-based, including means for directing a laser beam therein, adapted to be operable responsive to control by a laser control program for printing the unique directly-addressible personal identifier code on the elections process form; and

(b) portable compact means for reading the unique directly-addressible personal identifier code from the elections process form, microprocessor-based, adapted to be operable responsive to control by the operator, and control by a reading control program, to generate data associated with the person identified by the code relating to the elections process, for processing thereof for use in the elections process.

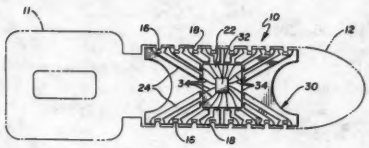
4,578,573

PORTABLE ELECTRONIC INFORMATION DEVICES AND METHOD OF MANUFACTURE

William P. Flies, Burnsville, and William H. Wehrmacher, Prior Lake, both of Minn., assignors to Datakey, Inc., Burnsville, Minn.

Filed Mar. 23, 1983, Ser. No. 477,905
Int. Cl.[4] G06K *19/06*
U.S. Cl. 235—492 **18 Claims**

1. As an article of manufacture, a portable electronic device constructed and arranged for insertion into a mating receptacle, comprising a device body and a printed circuit substrate board carried by the device body, the board including electronic circuit means and a plurality of spaced indentations provided by exposed portions of plated through-holes on the board, the indentations being arranged along the length of the board on at least one edge thereof, each indentation extending across the edge of the board from one surface thereof to the other and being provided with a plated conductive area origi-



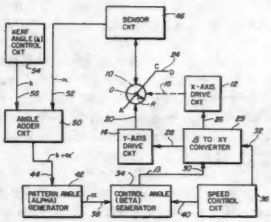
nating from a portion of a plated through-hole as aforesaid which portion is exposed exteriorly of the device body whereby each indentation serves as an electrical contact surface for mating with contacts in the receptacle, and discrete conductive pathways extending between each of the conductive areas and the electronic circuit means on the printed circuit board.

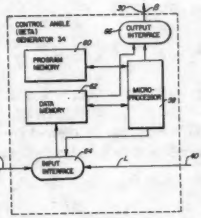
4,578,574

PATTERN TRACER WITH VARIABLE EFFECTIVE FORWARD OFFSET AND METHOD

John W. Grant, River Forest, and Francis E. Ferrari, LaGrange Park, both of Ill., assignors to Stewart-Warner Corporation, Chicago, Ill.

Filed Sep. 30, 1982, Ser. No. 428,577
Int. Cl.[4] G05B *1/00*
U.S. Cl. 250—202 **52 Claims**





1. A pattern tracer for tracing a pattern at a selected speed with a tracing element, comprising:

a sensor for detecting a pattern;

means for storing pattern information from said sensor; and

means for controlling the movement of the tracing element along the pattern in accordance with portions of said stored information selected on the basis of the selected speed.

4,578,575

OPERATING THEATRE LAMP

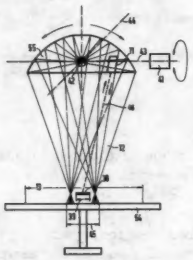
Eberhard Roos, Tuttlingen, Fed. Rep. of Germany, assignor to Delma, electro- und medizinische Appatebau Gesellschaft mbH, Tuttlingen, Fed. Rep. of Germany

Filed Nov. 17, 1983, Ser. No. 552,647

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1982, 3243710

Int. Cl.[4] G01J *1/20*

U.S. Cl. 250—203 R **9 Claims**



1. An operating theatre lamp which transmits a directed beam of light, which is pivotally arranged about two axes which are substantially perpendicular to one another and to the light beam above the site of an operation and which generates a restricted field of light within the site of the operation, wherein said restricted field of light can be substantially horizontally displaced through pivotal movement of the lamp, characterised in that the operating theatre lamp has a light beam selector (11) which is movable with the lamp, which comprises light sources (14, 16, 18, 20) and light receivers (15, 17, 19, 21), and which concentrates a beam of electromagnetic radiation (46) narrower than said light beam (12) and in a different frequency range into a control field (39) within the field of light (45);in that a control reflector (38) is provided which is displaceable in a horizontal plane within the site of the operation, which is matched to the size of the control field (39) and is likewise smaller than the field of light (45) and which reflects the electromagnetic radiation (46) back on itself, at least in part, to the photoreceivers (15, 17, 19, 21); and in that the light sources (14, 16, 18, 20) and the photoreceivers (15, 17, 19, 21) are so arranged in the light beam selector (11) that, when the control reflector (38) leaves the control field (39), the photoreceivers (15, 17, 19, 21) transmit signals to an electronic control circuit (40) through which positioning motors (41, 42) connected to the control circuit (40) are actuated to pivot the lamp about the two axes in the sense of a follow-up adjustment of the control field (39).

4,578,576

BAR CODE READER WITH DIODE FEEDBACK IN AMPLIFIER

Jay A. Wheeler, Encinitas, Calif., and James A. Willmore, Eden Prairie, Minn., assignors to Opto Systems, Inc., San Diego, Calif.

Filed Mar. 30, 1983, Ser. No. 480,384

Int. Cl.[4] H01J *40/14;* **H03F** *1/36*

U.S. Cl. 250—214 A **3 Claims**

1. In a circuit for controlling the point of saturation of an operational amplifier, said circuit comprising:

(a) an operational amplifier having positive and negative input terminals, an output terminal and connections for receiving a positive and negative operating voltage;

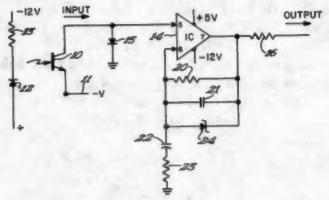
(b) a diode connected to ground and said positive terminal of said operational amplifier said diode conducting current to ground;

(c) a feedback circuit connected between the output of said operational amplifier and said negative input terminal;

(d) a time constant circuit connected between ground and said negative input terminal;

(e) a power source having a positive and negative voltage connection connected to said operational amplifier;

(f) a zener diode connected in parallel with said feedback circuit to control the saturation of said operational amplifier, said zener establishing the saturation point below normal saturation point of said operational amplifier;



(g) a phototransistor reading indica passing thereby connected to the positive input of said operational amplifier;

(h) and a light source flooding said indica to be read by said phototransistor.

4,578,577

LIGHT BEAM SCANNING DEVICE

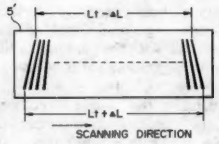
Masaru Noguchi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 25, 1983, Ser. No. 497,935

Claims priority, application Japan, May 31, 1982, 57-92787

Int. Cl.[4] H01J *3/14*

U.S. Cl. 250—235 **6 Claims**



1. A light beam scanning reticle comprising:

a grid pattern having alternate transparent and opaque portions arranged side by side in a row, said row being in a light beam deflection direction, said grid pattern having a plurality of spaced apart portions, wherein said spacing varies in a direction perpendicular to said deflection direction; wherein, a light spot, generated by said light beam, is moved across both a scanning plane and said grid pattern, wherein said light beam passes through said grid pattern to an optical detector which generates a photo-electric signal, wherein any irregularity in the speed of the light spot on the scanning plane is corrected in response to said photo-electric signal.

4,578,578

METHOD FOR CORRECTING SPECTRUM SHIFT

Chew-Chen Lin, Houston, and Frank L. Lankford, Jr., Bellaire, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 5, 1983, Ser. No. 557,804

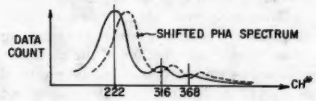
Int. Cl.[4] G01B *18/00*

U.S. Cl. 250—252.1 **16 Claims**

1. A method for evaluating at least one subject element comprising the steps of:

detecting radiation from a plurality of elements including the subject element;

providing data pulses representative of the detected radiation;
deriving a spectrum from the data pulses;
determining a shift of the spectrum; and



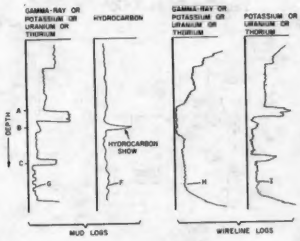
evaluating the subject element as functionally related to an energy level of data pulses occurring in a region of interest associated with the subject element in accordance with the spectrum and the determined shift of the spectrum.

4,578,579

METHOD FOR DEPTH REFERENCING HYDROCARBON GAS SHOWS ON MUD LOGS

Eric P. Dion, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 1, 1983, Ser. No. 528,503
Int. Cl.[4] G01V *11/00, 5/06*
U.S. Cl. 250—256 **7 Claims**



1. A method for identifying hydrocarbon formations surrounding a borehole, comprising the steps of:
a. measuring hydrocarbon gas in the entrained formation cuttings obtained during drilling operations in which a drilling mud is continually circulated past a drill bit to carry said cuttings to the earth's surface,
b. simultaneously measuring natural gamma radiation in said cuttings,
c. identifying the depths at which said cuttings were obtained within the borehole,
d. measuring natural gamma radiation within the borehole following completion of said drilling operations,
e. correlating said natural gamma radiation measurements in steps (b) and (d), and
f. identifying the depths within the borehole from which the entrained cuttings containing hydrocarbon gas were obtained during drilling operations when there is correlation between said natural gamma radiation measurements in steps (b) and (d).

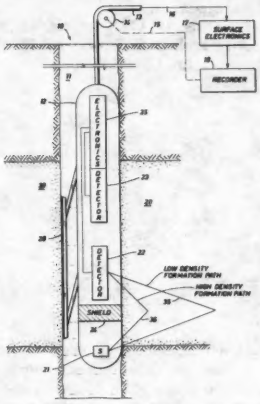
4,578,580

GAMMA SPECTRUM POROSITY MEASUREMENT

Harry D. Smith, Jr., Houston, Tex., assignor to Halliburton Company, Duncan, Okla.

Filed Jan. 27, 1984, Ser. No. 574,761
Int. Cl.[4] G01V *5/00*
U.S. Cl. 250—269 **9 Claims**

1. A density logging method for measuring the density of downhole earth formations penetrated by a borehole, comprising:
(a) emitting gamma rays from the borehole into the formation to be measured, the energy spectrum of the gamma rays including energies above the threshold below which photoelectric absorption from formation and/or borehole elements becomes significant,
(b) obtaining with a gamma ray detection system a measure



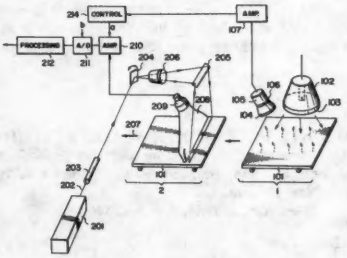
of the shape of the energy spectrum of the attenuated gamma rays which are Compton scattered back to the borehole, and
(c) deriving from the spectrum shape measurement a measure of the density of the formation.

4,578,581

RADIATION IMAGE READ-OUT METHOD AND APPARATUS

Hiroshi Tanaka, and Hisatoyo Kato, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 26, 1983, Ser. No. 517,305
Claims priority, application Japan, Jul. 27, 1982, 57-130939
Int. Cl.[4] G03C *5/16*
U.S. Cl. 250—327.2 **10 Claims**



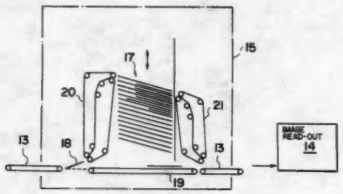
1. A radiation image read-out method in which a stimulable phosphor sheet carrying a radiation image stored therein is exposed to stimulating rays which cause the stimulable phosphor sheet to emit light in the pattern of the stored image, and the emitted light is photoelectrically read out, wherein, prior to final read-out for obtaining a visible image for viewing purposes, conducting preliminary read-out for detecting said radiation image by uniformly exposing the whole surface of said stimulable phosphor sheet to stimulating rays and detecting the amount of light emitted from the whole surface of said stimulable phosphor sheet.

4,578,582

RADIATION IMAGE RECORDING AND REPRODUCING SYSTEM WITH PREFERENTIAL PROCESSING FUNCTION

Masao Takano, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 19, 1982, Ser. No. 435,203
Claims priority, application Japan, Oct. 27, 1981, 56-171767
Int. Cl.[4] G01T *1/105*
U.S. Cl. 250—327.2 14 Claims



1. A radiation image recording and reproducing system comprising; at least one radiation image input section for recording a radiation image of an object on a stimulable phosphor sheet capable of storing radiation energy thereon by exposure thereof to a radiation passing through the object, an image read-out section for exposing said stimulable phosphor sheet carrying the radiation image stored thereon to a stimulating ray and photoelectrically reading out light emitted from said stimulable phosphor sheet upon stimulation thereof by said stimulating ray to obtain an image signal, an image processing section for processing said image signal sent form said read-out section, an image reproducing section for reproducing the radiation image by use of a reproducing signal sent from said image processing section, at least one sheet supplying means for supplying said stimulable phosphor sheet carrying the radiation image recorded thereon at said radiation image input section to a sheet feeding line connected to said image read-out section, a stack zone positioned on said sheet feeding line for sequentially storing said stimulable phosphor sheets supplied from said sheet supplying means and sending said phosphor sheets one by one to said image read-out section,

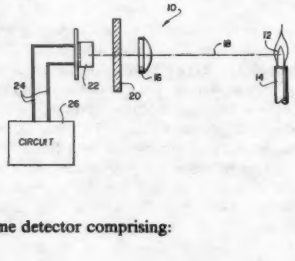
a radiation image recording and reproducing system provided with a preferential processing function, comprising a by-pass feeding line positioned on said sheet feeding line for by-passing said stack zone, and a feeding line switching mechanism for making said sheet feeding line communicate with said by-pass feeding line in response to a preferential processing signal.

4,578,583

SOLID STATE ULTRAVIOLET FLAME DETECTOR

Richard C. Ciammaichella, Chardon, and Barry J. Youmans, Rittman, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Apr. 3, 1984, Ser. No. 596,483
Int. Cl.[4] G01J *1/42*
U.S. Cl. 250—339 4 Claims



1. A flame detector comprising:

light collection means for collecting electromagnetic radiation from a flame source and having an optical axis;

filter means lying on said optical axis for receiving electromagnetic radiation collected by said light collection means, and for passing only that portion of the electromagnetic radiation which changes dependent upon whether a flame is present at the flame source;

a solid state photocell lying on said optical axis and positioned for receiving said portion of the electromagnetic radiation passed by said filter means, said photocell being is made of GaAsP semiconductor material sensitive to said portion of electromagnetic radiation to generate a sensed light signal indicative of one of the flame on and the flame off condition for the flame source; and

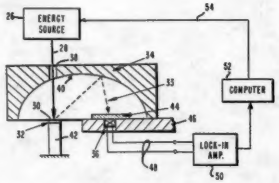
circuit means connected to said photocell for producing one of a flame on and a flame off signal when said photocell generates said sensed light signal.

4,578,584

THERMAL WAVE MICROSCOPY USING AREAL INFRARED DETECTION

Thomas Baumann, Stuttgart, Fed. Rep. of Germany; Frank H. Dacol, White Plains, and Robert L. Melcher, Mount Kisco, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 23, 1984, Ser. No. 573,075
Int. Cl.[4] G01J *1/00*
U.S. Cl. 250—341 24 Claims



1. A non-contact method for detection of surface, on the surface, and sub-surface structure in a sample, comprising the steps of:

irradiating a selected area of said sample with radiation in order to create a thermal wave therein which interacts with the structure of said sample to produce a temperature pattern on the surface of said sample in the vicinity of said selected area,

imaging substantially all of the infrared radiation emitted from said sample onto a two-dimensional infrared detector having an area comparable in size to the area of said sample and being out of physical contact with said sample, to create a two-dimensional infrared image, said infrared image being characteristic of the structure of said sample in the area of said sample heated by said radiation,

changing said selected area of said sample after each said imaging step by moving only said radiation to irradiate a different area of said sample in order to scan said sample, the position of said infrared detector being fixed during said scanning.

4,578,585

DETECTOR HEAD MOUNTING MECHANISM

Anatoly I. Gosis, Palatine, and Frank J. Bartos, Elmhurst, both of Ill., assignors to Siemens Gammasonics, Inc., Des Plaines, Ill.

Filed Nov. 25, 1983, Ser. No. 555,100
Int. Cl.[4] G01T *1/166;* G21K *1/02*
U.S. Cl. 250—363 S 17 Claims

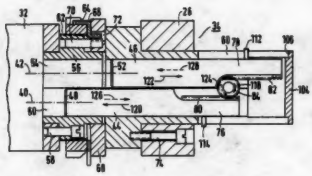
1. A mechanism for pivotally mounting a detector head including a collimator onto supporting structure of a radiation detector, comprising:

(a) means for mounting the head onto the supporting structure for rotation about a selected one of a first axis and a second axis; and

(b) means for selecting the axis about which the detector head can rotate whereby the head will be rotatable about the axis which passes nearest to the center of gravity of the head;

wherein the head mounting means includes

(a1) a first pinhole and an associated first pin mounted between the supporting structure and the detector head concentric with the first axis and shiftable relatively to each other along the first axis between a first shift position wherein the first pin intrudes into the first pinhole and a second shift position wherein the first pin is located outside the first pinhole; and



(a2) a second pinhole and an associated second pin mounted between the supporting structure and the detector head concentric with the second axis and shiftable relatively to each other along the second axis between a first shift position wherein the second pin intrudes into the second pinhole and a second shift position wherein the second pin is located outside the second pinhole;

and wherein the axis selecting means includes

means for shifting the pinholes and associated pins relatively to each other in opposite directions such that when one pinhole and the associated pin are in the first shift position, the other pinhole and associated pin are in the second shift position.

4,578,586

CHEMICAL AGENT MONITOR AND ALARM DEVICE

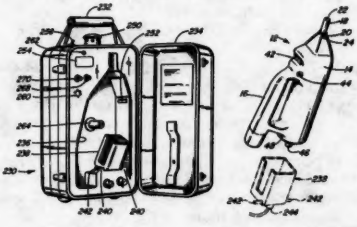
Jonathan M. Preston, Ottawa, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence of Her Majesty's Canadian Government, Ottawa, Canada

Filed Jan. 27, 1984, Ser. No. 574,538

Claims priority, application United Kingdom, Mar. 30, 1983, 8308783; Sep. 30, 1983, 8326205

Int. Cl.⁴ G01T *1/18;* **G01D** *11/24;* **G08B** *23/00*

U.S. Cl. 250—382 **18 Claims**



1. Apparatus for use with a hand-portable chemical agent detector for continuously monitoring an atmosphere for the presence of predetermined chemical agents, said detector having means for ionizing air samples and providing at an output terminal electrical signals representative of the mobility spectrum of ionized chemical vapours produced by said ionizing means, said apparatus comprising:

means defining a chamber in said apparatus for supporting and removably enclosing said detector;

means for communicating ambient atmosphere to said chamber;

electrical circuit means in said apparatus, said circuit means being adapted to be detachably connected to said detector output terminal when said detector is positioned in said chamber and being responsive to said electrical signals for producing an alarm signal when said signals detect a chemical agent concentration in said atmosphere exceeding a predetermined concentration level; and

alarm means responsive to said alarm signal.

4,578,587

ERROR-CORRECTED CORPUSCULAR BEAM LITHOGRAPHY

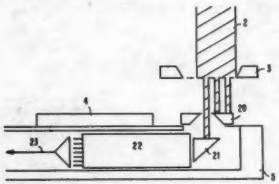
Uwe Behringer; Harald Bohlen, both of Ammerbuch; Peter Nehmiz, Stuttgart, and Werner Zapka, Gaertringen-Rohrau, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 25, 1985, Ser. No. 694,888

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1984, 34108885

Int. Cl.⁴ H01J *37/304, 37/317*

U.S. Cl. 250—492.2 **10 Claims**



1. An Apparatus for detecting errors in exposure masks for corpuscular beam lithography, comprising an image mask,

a pinhole diaphragm, located beneath said image mask, having a pinhole with submicron dimensions therein,

means for forming a corpuscular beam,

means for forming a projection image of selected mask regions of an exposure mask under review,

means for tilting the corpuscular beam and guiding the beam, in at least one plane through said mask and across said pinhole in said diaphragm, and

a corpuscular beam detection means positioned below said diaphragm for detecting the beam passing through said pinhole in said diaphragm in order to detect errors in said mask.

4,578,588

VOLUME REDUCTION IN LIQUID SCINTILLATION COUNTING

Benjamin M. Galkin, 35 Ivy La., Cherry Hill, N.J. 08002

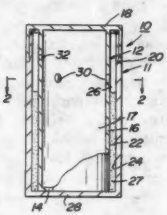
Filed Aug. 12, 1983, Ser. No. 522,943

Int. Cl.⁴ G01N *21/11, 21/03*

U.S. Cl. 250—432 R **21 Claims**

1. A volume reducer usable with a scintillation vial, said vial having inner peripheral bottom and side surfaces defining an interior compartment adapted to receive scintillation fluid therein, characterized in that said reducer includes an elongate member having outer peripheral bottom and side surfaces adapted to displace scintillation fluid in the vial when inserted into the interior compartment of said vial, said outer peripheral side surface of the elongate member, when positioned in the vial, being spaced inwardly from the inner peripheral side surface of said vial to define an annular chamber for accommo-

dating the scintillation fluid therein, whereby small amounts of scintillation fluid can be spread over a large surface in said annular chamber for use in a scintillation counting operation,



said elongate member including keying means therein adapted to cooperate with keying means on said vial for locating the elongate member in a predetermined orientation relative to said vial.

4,578,589

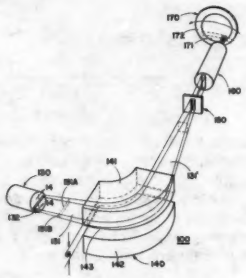
APPARATUS AND METHODS FOR ION IMPLANTATION

Derek Aitken, East Molesey, England, assignor to Applied Materials, Inc., Santa Clara, Calif.

Continuation-in-part of Ser. No. 523,463, Aug. 15, 1983, abandoned. This application Aug. 15, 1984, Ser. No. 641,027

Int. Cl.[4] H01J *37/317, 37/04*

U.S. Cl. 250—492.2 **48 Claims**



1. In a system for implanting ions of a preselected chemical species into a target element in the form of an ion beam having a preselected beam current level at least about several milliamperes, source means for producing an ion beam including ions of said preselected chemical species at or above said preselected beam current level; beam analyzing means for receiving said ion beam and selectively separating various ion species in said beam on the basis of mass to produce an analyzed beam exiting said analyzing means, and beam resolving means disposed in the path of said analyzed beam for permitting ions of said preselected chemical species to pass to said target element; said analyzing means having an ion dispersion plane associated therewith; said source means having an associated ion emitting envelope including an area of substantial extension in a plane parallel to said ion dispersion plane and producing an ion beam characterized by a beam envelope which retains an area of substantial extension in a plane parallel to said ion dispersion plane throughout the region between said source and said analyzing means and by ions entering said analyzing means travelling substantially either toward or from a common apparent line object perpendicular to said ion dispersion plane.

4,578,590

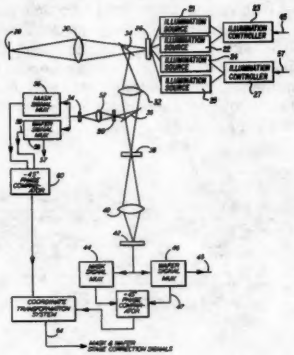
CONTINUOUS ALIGNMENT TARGET PATTERN AND SIGNAL PROCESSING

Frederick Y. Wu, Cos Cob, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed May 2, 1983, Ser. No. 490,614

Int. Cl.[4] G01N *21/86*

U.S. Cl. 250—548 **7 Claims**



1. In an alignment system for a scanning mask aligner employing continuous alignment patterns on a mask and continuous alignment patterns on a wafer in the scribe lines that run in the direction of scan, the combination comprising a viewing system having optical grid means, means for moving the patterns across said optical grid means in the viewing system, said mask patterns and said wafer patterns each having front edge portions and rear edge portions respectively, said front edge portions being displaced with respect to said rear edge portions in the direction of scanning so that only light corresponding to a plurality of said front edge portions is transmitted through said grid means during one period of time and only light corresponding to a plurality of said rear edge portions is transmitted through said grid means during a second later period in time, said grid means corresponding to the directions and spacings of the patterns so that light transmitted through the grid means is strongly modulated, and means responsive to said transmitted light operative to output alignment error signals.

4,578,591

CONTROL CIRCUIT FOR AUTOMOTIVE ACCESSORY SYSTEM

William M. Floyd, Livonia, and David L. Juzwik, Dearborn Heights, both of Mich., assignors to United Technologies Automotive, Inc., Dearborn, Mich.

Filed Oct. 25, 1984, Ser. No. 664,804

Int. Cl.[4] H02J *1/00*

U.S. Cl. 307—10 R **16 Claims**

1. A control circuit for selectively determining multiple modes of operation for one or more electrical loads in an automotive accessory system, the circuit comprising:

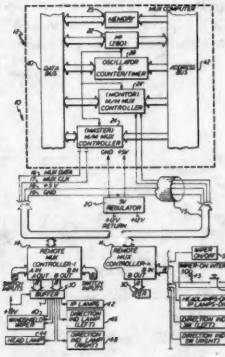
for a said load, a respective momentary action switch operatively associated with a signal potential and being responsive to an actuating force to provide a signal indicative of switch actuation only while said actuating force persists;

microcomputer control means;

means for extending said signal indicative of switch actuation to said microcomputer control means; and

wherein said microcomputer control means repetitively, at brief intervals, determines the presence or absence of said actuation signal of a respective said switch and the duration of a said switch actuation signal, while present, relative to a predetermined time threshold and is operative

following a determination that said switch actuation signal was present only for a momentary interval less than said predetermined threshold to effect control of a said load in



a primary mode and is operative following a determination that said switch actuation signal was present for a dwell interval longer than said predetermined threshold to effect control of a said load in a secondary mode.

4,578,592

STEERING WHEEL ASSEMBLY WITH CENTRALIZED CONTROL SYSTEM

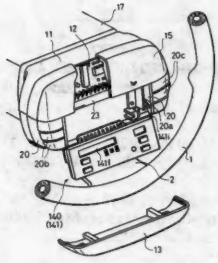
Takaaki Nakazawa, Toyota; Kenichi Kazaoka, Nagoya; Nobuo Okazaki, Konan, and Kunihiko Nakashima, Green, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyoda Gosei Co., Ltd., Nishikasugai, both of, Japan

Filed May 31, 1984, Ser. No. 615,587

Claims priority, application Japan, Jun. 4, 1983, 58-100072

Int. Cl.[4] H01H *9/00, 25/00*

U.S. Cl. 307—10 R **9 Claims**



9. A steering wheel assembly with a control system, comprising:

a steering wheel;

a center pad;

a spoke connecting said steering wheel and said center pad; and

a connecting plug positioned in said center pad wherein said center pad further comprises means formed therein selectively and interchangeably receiving one end of a plurality of terminal components for connection with said connecting plug, said terminal component comprising a plurality of output means corresponding to a plurality of electrical appliances and used in controlling said electrical appliances.

4,578,593

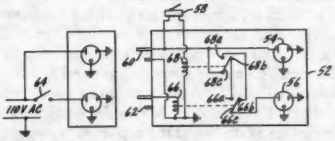
TWO-WAY ELECTRICAL CONTROL MODULE FOR A LAMP OUTLET

Mircho A. Davidov, 10337 Rue Finisterre, San Diego, Calif. 92131

Filed Nov. 5, 1984, Ser. No. 668,210

Int. Cl.[4] H01H *47/00*

U.S. Cl. 307—113 **5 Claims**



1. An electrical control module adapted to be connected to a wall-type receptacle to provide remote on/off switching of an electrical device such as a lamp or the like, and in which a wall-type on/off switch for the device is separately connected to the wall receptacle, said module including a housing, at least one receptacle outlet in the housing and adapted to receive a plug from the electrical device, a plug connection extending from the housing and adapted for insertion in the wall-type receptacle and connection to the wall-type on/off switch, means for providing a power line input to the housing, a remote on/off switch connected to the housing, and relay means positioned within the housing and connected between the plug connection, the power line input, the receptacle outlet and the remote on/off switch, said relay means including a first relay and a second relay, with each relay including a coil, with power to the first relay coil being controlled by the wall-type on/off switch and with power to the second relay coil being controlled by the remote on/off switch, whereby power is supplied to or removed from said receptacle outlet by independently operating either said remote on/off switch or the wall-type on/off switch.

4,578,594

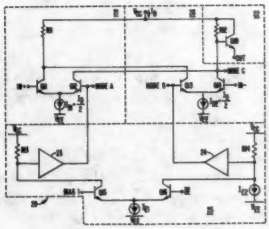
CIRCUIT AND METHOD FOR SPLIT BIAS ENABLE/INHIBIT MEMORY OPERATION

Joe Santos, Lafayette, Calif., assignor to Fairchild Camera & Instrument Corporation, Palo Alto, Calif.

Filed Jan. 25, 1984, Ser. No. 573,532

Int. Cl.[4] H03K *17/56, 5/22*

U.S. Cl. 307—241 **11 Claims**



1. A circuit for steering a current supplied by a current source to produce a predetermined circuit output signal in response to a selected circuit differential input signal, comprising:

a first differential amplifier, coupled to receive said current, for steering said current along a first current path in response to said selected circuit differential input signal;

a second differential amplifier, coupled to receive said current, for alternatively steering said current along a second

current path in response to said selected circuit differential input signal;

output means, coupled to receive said current, for producing said predetermined circuit output signal according to which of said first and second current paths said current is steered; and

means, coupled to said first and second differential amplifiers, for producing a balanced control signal to selectively enable each of said first and second differential amplifiers, whereby said current is steered along a selected one of said first and second current paths in response to said selected circuit differential input signal to produce said predetermined circuit output signal; and for alternatively producing a split control signal to selectively inhibit each of said first and second differential amplifiers, whereby said current is steered along a predetermined one of said first and second current paths to continually produce a corresponding circuit output signal without regard to said selected circuit differential input signal.

4,578,595

CIRCUIT ARRANGEMENT FOR DRIVE OF A THYRISTOR WITH LIGHT

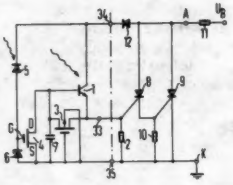
Jenö Tihanyi; Christine Fellinger, and Ludwig Leipold, all of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 24, 1984, Ser. No. 664,485

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1983, 3344476

Int. Cl.[4] H03K *17/60, 3/45, 17/687*

U.S. Cl. 307—252 R **8 Claims**



1. A circuit arrangement for drive of at least one thyristor connected to an alternating voltage, comprising:

(a) a phototransistor, thyristor, and auxiliary transistor circuit means for enabling an ignition of the thyristor only in a proximity of a zero point of the alternating voltage;

(b) a collector-emitter path of the phototransistor being connected between a first of two alternating voltage terminals and a gate terminal of the thyristor; and

(c) said auxiliary transistor circuit means being formed of

(i) an enhancement type IGFET whose source-drain path is connected between a base terminal of the phototransistor and a second alternating voltage terminal;

(ii) a photodiode between a gate terminal of the IGFET and the first alternating voltage terminal;

(iii) the photodiode being poled such that it is biased in a reverse direction when voltage is present at the thyristor in a conducting direction; and

(iv) the IGFET having a higher threshold voltage and a lower input capacitance than the phototransistor.

4,578,596

CIRCUIT ARRANGEMENT FOR DRIVING A THYRISTOR WITH A PHOTOTRANSISTOR

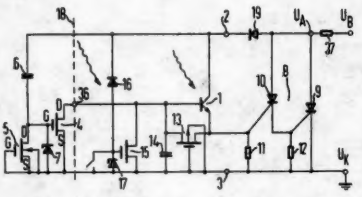
Jenoë Tihanyi; Christine Fellinger, and Ludwig Leipold, all of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 24, 1984, Ser. No. 664,380

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1983, 3344435

Int. Cl.[4] H03K *17/60, 3/45, 17/687*

U.S. Cl. 307—252 R **6 Claims**



1. A circuit arrangement for driving at least one thyristor connected to an alternating voltage from a phototransistor, comprising:

(a) a phototransistor connected to drive the thyristor connected to an alternating voltage;

(b) an emitter-collector path of said phototransistor connected between a first of two alternating voltage terminals and a gate terminal of said thyristor;

(c) a drain-source path of an enhancement type IGFET connected between a base terminal of said phototransistor and a second of said two alternating voltage terminals;

(d) a drain-source path of a depletion type IGFET connected between a gate terminal and a source terminal of said enhancement type IGFET;

(e) a gate terminal of said depletion type IGFET and a source terminal thereof being electrically connected to said second alternating voltage terminal; and

(f) a capacitor connected between the drain terminal of said depletion type IGFET and said first alternating voltage terminal.

4,578,597

LARGE AMPLITUDE PULSE GENERATING CIRCUITS

Mitsuo Soneda, Zama; Manami Fukuzawa, Aiko, and Takaji Ohtsu, Hatano, all of Japan, assignors to Sony Corporation, Tokyo, Japan

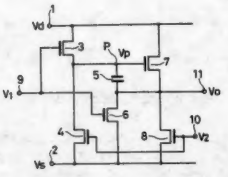
PCT No. PCT/JP83/00068, § 371 Date Nov. 2, 1983, § 102(e) Date Nov. 2, 1983, PCT Pub. No. WO83/03174, PCT Pub. Date Sep. 15, 1983

PCT Filed Mar. 5, 1983, Ser. No. 552,036

Claims priority, application Japan, Mar. 5, 1982, 57-34765

Int. Cl.[4] H03K *3/017, 5/04*

U.S. Cl. 307—265 **4 Claims**



1. A pulse generating circuit comprising a series connection of a first switching element (3:13) and a second switching element (4), between first and second power supply terminals,

a series connection of a capacitive element (5) and a third switching element (6) coupled between a connecting point between the first and second switching elements and one of said power supply terminals, an amplifying (7) having input and output terminals connected to both ends of the capacitive element (5), respectively, and a fourth switching element (8) connected between the output end of the amplifying element (7) and said one power supply terminal, means for supplying a first input signal to the control terminals of the first and third switching elements and for supplying a second input signal to the control terminals of the second and fourth switching elements, whereby a pulse having a width corresponding to the time interval from a variation in the level of the first input signal to a variation in the level of the second input signal is obtained at the output end of the amplifying element (7).

4,578,598

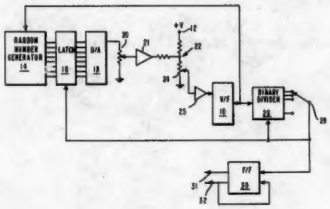
RANDOM PULSE GENERATOR CIRCUIT

Mark E. Faulhaber, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 17, 1984, Ser. No. 631,650

Int. Cl.[4] H03L *29/00, 7/00;* **G06F** *1/02*

U.S. Cl. 307—271 **4 Claims**



1. A circuit for generating a sequence of electrical pulses wherein the pulse duration, the pulse interval, the pulse repetition frequency, the degree of randomness of the pulse repetition frequency and the pulse interval are selectable said circuit comprising:

(a) a voltage-to-frequency converter for generating binary-valued pulses, said converter having an output terminal to supply said binary-valued pulses and an input terminal to receive an input voltage comprising the sum of a fixed voltage which defines average pulse rate, and a random voltage, which defines a degree of variation of the pulse rate;

(b) a first voltage source for supplying said random voltage;

(c) a second voltage source for said fixed voltage;

(d) circuit means for connecting said random voltage and said fixed voltage to said input terminal of the voltage-to-frequency converter; and

(e) circuit means to divide the output pulses of said voltage-to-frequency converter and vary the average voltage applied to the input terminal of the voltage-to-frequency converter for providing pulse rate adjustment.

4,578,599

FLIP-FLOP HAVING IMPROVED SYNCHRONOUS RESET

William A. Birch, Tempe, and Lillie M. Woodard, Chandler, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 2, 1983, Ser. No. 500,594

Int. Cl.[4] H03K *3/289*

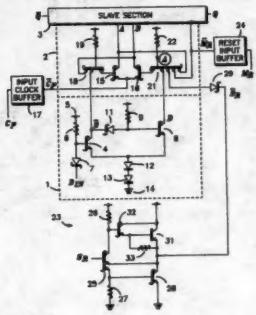
U.S. Cl. 307—272 A **7 Claims**

1. A flip-flop comprising:

data gate circuit means for receiving input data and for generating therefrom first and second complementary internal data signals representative of said input data;

master circuit means coupled for receiving a plurality of clock pulses in series and coupled to said data gate circuit means for latching said first and second complementary internal data signals during a predetermined portion of one of said clock pulses;

slave circuit means coupled to said master circuit means for storing said latched first and second complementary internal data signals; and



reset means coupled to said master circuit means for resetting said latched first and second complementary internal data signals on the occurrence of the next of one of said clock pulses, said reset means including a reset signal having a voltage level greater than said clock pulse, but less than said input data.

4,578,600

CMOS BUFFER CIRCUIT

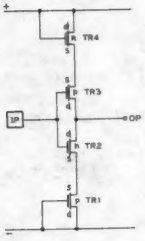
Terence E. Magee, Fulbourn, England, assignor to ITT Industries, Inc., New York, N.Y.

Filed Jan. 25, 1983, Ser. No. 460,953

Claims priority, application United Kingdom, Jan. 26, 1982, 8202151

Int. Cl.[4] H03K *19/094, 17/687*

U.S. Cl. 307—451 **1 Claim**

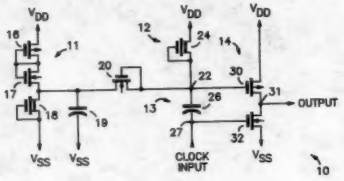


1. A complementary metal-oxide-silicon (CMOS) logic input circuit, including first and second complementary pairs of n-channel and p-channel transistors series coupled between the positive and negative supply terminals of the circuit, wherein the gate and drain of the n-channel transistor of the first pair and the p-channel transistor of the second pair are coupled respectively to the positive and negative terminals, wherein the circuit input is coupled to the gates of the other n-channel and p-channel transistors and the circuit output is coupled to the drains of the other n-channel and p-channel transistors, and wherein the arrangement is such that, in use, the other transistors are so biased for the positive and negative supply terminals that their input threshold switching level is substantially independent of CMOS device characteristic tolerances.

4,578,601
HIGH SPEED TTL CLOCK INPUT BUFFER CIRCUIT WHICH MINIMIZES POWER AND PROVIDES CMOS LEVEL TRANSLATION

Doyle V. McAlister, Pflugerville, Tex., and Richard D. Crisp, Beaverton, Oreg., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 7, 1983, Ser. No. 559,070
Int. Cl.⁴ H03K *19/096*
U.S. Cl. 307—475 **9 Claims**



1. A clock input buffer circuit for buffering an input clock signal having TTL voltage levels to provide an output clock signal having MOS voltage levels, comprising:

inverter means having first and second transistors of opposite conductivity type coupled between first and second power supply voltage terminals, the first transistor having a control electrode connected to a first node coupled to the input clock signal and having a predetermined threshold voltage, the second transistor having a control electrode connected to an input node also coupled to the input clock signal;

reference voltage means for providing a predetermined bias voltage to the first node, said predetermined bias voltage differing from the first supply voltage by substantially the predetermined threshold voltage;

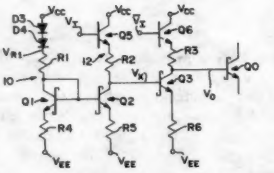
means connected to the first node for coupling the first power supply voltage terminal to the first node, thereby limiting voltage at said first node to substantially within the first transistor threshold voltage of the first transistor of the inverter means; and

voltage translation means coupled between the first node and the input node, for translating the input clock signal received at the input terminal to a proportional signal at the first node.

4,578,602
VOLTAGE SIGNAL TRANSLATOR

Jeffery A. West, Pleasant Grove, Utah, and Thomas D. Fletcher, Wijchen, Netherlands, assignors to Signetics Corporation, Sunnyvale, Calif.

Filed Jul. 11, 1983, Ser. No. 512,269
Int. Cl.⁴ H03K *15/092, 3/01*
U.S. Cl. 307—475 **11 Claims**

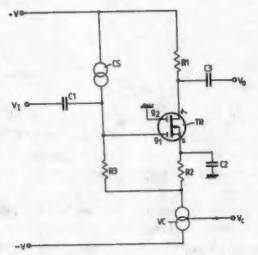


1. A signal translator for converting an input voltage signal into an output voltage signal at a different voltage level wherein: a first bipolar transistor has a collector coupled to one end of a first impedance element, a base connected directly to the collector, and an emitter coupled to a first voltage supply; a like-polarity second bipolar transistor has a collector coupled to one end of a second impedance element, a base connected to the other base, and an emitter coupled to the first supply; a like-polarity output bipolar transistor has a collector which provides the output signal and is coupled to one end of an output impedance element whose other end is coupled to a second voltage supply, a base coupled to the collector of the second transistor, and an emitter coupled to the first supply; a like-polarity input bipolar transistor has a collector coupled to the second supply, a base which receives the input signal, and an emitter coupled to the other end of one of the first and second impedance elements; and device means provides a selected voltage to the other end of the other of the first and second impedance elements; characterized by: an impedance element coupled between the first supply and the emitter of the first transistor; and an impedance element coupled between the first supply and the emitter of the second transistor.

4,578,603
TEMPERATURE-INDEPENDENT GAIN CONTROL CIRCUIT

Hugh McPherson, Tweeddale, Scotland, assignor to Ferranti plc, Cheshire, England

Filed Mar. 23, 1983, Ser. No. 478,098
Claims priority, application United Kingdom, Mar. 31, 1982, 8209473
Int. Cl.⁴ H03K *3/353*
U.S. Cl. 307—493 **2 Claims**



1. A temperature-independent gain control circuit comprising:

a dual-gate MOSFET having a pair of gates, a source and a drain;

a signal input connection to one of said MOSFET gates;

a source resistance having two terminals, one of said source resistance terminals being connected to said MOSFET source such that during operation a voltage drop proportional to drain current is developed across said source resistance; and

control means responsive to a control voltage for varying MOSFET drain current in proportion to the control voltage by controlling the biasing voltage between said other of said MOSFET gates and said other of said source resistance terminals, while establishing a biasing voltage between the other of said MOSFET gates and the other of said source resistance terminals, said control means including a differential amplifier having:

an output referenced to said other of said source resistance terminals and connected to said other of said MOSFET gates,

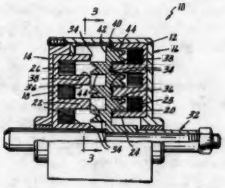
an input connected to one of said source resistance terminals and responsive during operation to the voltage drop across said source resistance, and

another input having the control voltage applied thereto.

4,578,604
SOLENOID ACTUATORS

John L. Eilertsen, Birmingham, Mich., assignor to Dante Giardini, Dearborn Heights, Mich., a part interest

Continuation-in-part of Ser. No. 323,239, Nov. 20, 1981. This application Mar. 15, 1984, Ser. No. 590,040
Int. Cl.[4] H02K *33/00*
U.S. Cl. 310—30 8 Claims



1. A solenoid actuator comprising a generally flat armature, means mounting said armature for movement through a defined stroke path having a path component perpendicular to said armature, and a stator mounted to said path-defining means and oriented with respect to said armature to be electromagnetically coupled to said armature for drawing said armature in the direction of said path component,

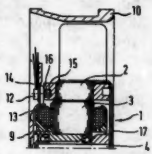
said stator comprising a plurality of spaced poles extending toward said armature, each of said poles having a pole end face perpendicular to said one path component and oppositely oriented pole side faces parallel to said path component,

said armature being an integral one-piece structure and comprising a generally flat body having a plurality of ribs integrally projecting from said body, one said rib between each pair of said spaced stator poles, each of said ribs having oppositely oriented side faces parallel to said path component and to said pole side faces, said body between said ribs having a flat face parallel and opposed to said pole end faces.

4,578,605
ELECTRIC MOTOR WITH A SYSTEM FOR MONITORING SPEED

Wilhelm Reinhardt, Schrozberg/Gütbach, and Ulrich Rüdele, Weissbach, both of Fed. Rep. of Germany, assignors to ebm Elektrobau Mulfingen GmbH & Co., Fed. Rep. of Germany

Filed Oct. 20, 1983, Ser. No. 543,935
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1982, 3241152
Int. Cl.[4] H02L *37/00*
U.S. Cl. 310—67 R 9 Claims



1. Electric motor for a system for speed monitoring, especially for compressors, fans, ventilators and blowers, where the rotational speed is monitored with the help of a speed-proportional signal, the motor having a stator and a rotor which can rotate in the stator, wherein the system for speed monitoring comprises:

a single permanent magnet mounted in the front end of the rotor facing the stator;

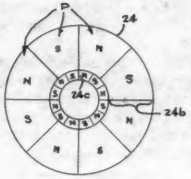
said permanent magnet being rod or disk shaped with a rectangular or round cross section of about 4 mm^2 to 28 mm^2 and a length of about 1 mm to 5 mm; and

a digital Hall-IC detector which is triggered by the magnetic field of the permanent magnet and which is located on the stator on a circle whose midpoint lies in the axis of rotation of the rotor and whose radius corresponds to the radius of the circular path of the permanent magnet, so that the nonrotating condition of the motor is indicated by either a continuous logic "0" or "1" output from the detector.

4,578,606
BRUSHLESS DC ELECTRIC MOTOR AND TACHOGENERATOR ASSEMBLY

Raymond E. Welterlin, Cary, N.C., assignor to Buehler Products, Inc., Raleigh, N.C.

Filed Dec. 13, 1984, Ser. No. 681,271
Int. Cl.[4] H02K *11/00*
U.S. Cl. 310—68 R 15 Claims



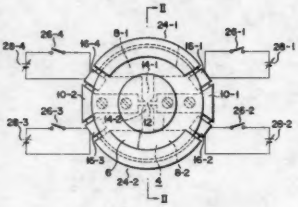
1. A brushless, self-commutating DC motor for driving computer discs, electronic equipment disc records and the like and including a tachogenerator for producing speed control signals of low frequency and of low jitter, comprising a disc-like motor including a rotor having a generally cup-shaped housing, an output drive shaft fixed to said housing, and a cylindrical annular permanent rotor magnet carried by said housing concentric with a center axis of rotation of the housing providing a center hole concentric with said axis, a stator assembly including a stator support member and a plurality of rotor drive coils and a speed signal generating coil assembly supported thereby, means journalling said output drive shaft and rotor including said drive coils on said stator support member, the annular rotor magnet having two tracks of multipolarization formed of an outer annular circular track over the major radial extent thereof having a plurality of driving magnetic poles segmented circumferentially of the rotor magnet of alternating polarity and an inner annular circular track of tachogenerator magnetic poles of a greater number than the driving poles segmented circumferentially of the rotor and located immediately adjacent the inner cylindrical boundary of the annular rotor magnet, and the signal generating coil assembly including stator coil means and yoke means of soft magnetic material coupled magnetically with the flux lines produced by said tachogenerator magnetic poles for producing tachogenerator signals of low frequency having a low jitter content to be processed by digital control circuitry for controlling the speed of the motor.

4,578,607

PIEZOELECTRIC PRECISE ROTATION MECHANISM FOR SLIGHTLY ROTATING AN OBJECT

Toru Tojo, Ninomiya, and Kazuyoshi Sugihara, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 26, 1984, Ser. No. 664,964
Claims priority, application Japan, Nov. 30, 1983, 58-225701
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—328 10 Claims



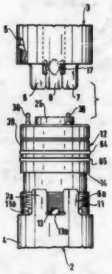
1. A precise rotation mechanism comprising:
a base member;
first and second movable sections;
a first fixed section arranged between the first and second movable sections and fixed to the base member;
first and second driving members capable of elongation and contraction, said first and second movable sections being coupled to said first fixed section through said first and second driving members, respectively;
a rotatable member having a rotation center and a surface facing the first and second movable sections;
means for defining an axis of rotation of said rotatable member;
first and second energizable fixing members being movable upon energization thereof for fixing said rotatable member to said first and second movable sections; and
energizing means for energizing said first and second fixing members and said first and second driving members, to rotate said rotatable member.

4,578,608

COUPLING FOR ELECTRIC MOTORS

Christian Mech, and Daniel Gironde, both of L'Isle Adam, France, assignors to Alsthom-Atlantique, Paris, France

Filed Mar. 22, 1985, Ser. No. 714,763
Claims priority, application France, Apr. 2, 1984, 84 05164
Int. Cl.[4] F04D *13/08;* F16D *1/04*
U.S. Cl. 310—112 5 Claims



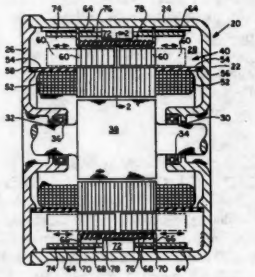
1. A coupling for electric motors, each of said motors comprising a rotor and a stator mounted in a tubular shell, the coupling including the improvement whereby the ends of the tubular shells to be assembled are shaped to be suitable for end-to-end inter-fitting in a manner which determines a relative angular position of the shells, said shape being identical on both shells to be assembled, the coupling further including an internal coupling module constituting a subassembly which is independent of the motors per se, said module comprising a coupling sleeve for coupling the rotor shafts, electrical connection means for interconnecting the stators, and support means acting both as radial bearings and as axial stops for the motors to be assembled, the end of at least one of the said rotor shafts to be coupled in rotation having a coupling section defined by the surface inside a closed, non-circular line having polar co-ordinates such that the polar radius is periodic over an angle equal to $2\pi/n$, where n is a positive integer greater than one, said sleeve having at least one end with a corresponding bore, the said end of the sleeve and of the shaft further including respective conjugate inlet shapes enabling the shaft to penetrate into the sleeve regardless of their relative angular positions by virtue of a force which is solely axial causing at least one of said two parts to rotate until both parts are correctly oriented relative to each other, the coupling further including link means between the internal coupling module and the shells.

4,578,609

PERMANENT MAGNET DYNAMOELECTRIC MACHINE

Frederick B. McCarty, San Pedro, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Sep. 29, 1982, Ser. No. 429,639
Int. Cl.[4] H02K *21/12*
U.S. Cl. 310—156 63 Claims



1. Electrical dynamo apparatus comprising:
an electrical conductor connectable to complete an electrical circuit, a permanent magnet movable relative to said electrical conductor, said permanent magnet providing a pair of magnetic poles of opposite polarity and a magnetic flux flowing between said pair of magnetic poles, first means defining a first magnetic circuit for communicating said magnetic flux between said pair of magnetic poles, said first magnetic circuit having a first magnetic reluctance and transecting said electrical conductor to induce an electromotive force therein in response to the combination of movement of said electrical conductor relative to said permanent magnet and flow of said magnetic flux in said first magnetic circuit, second means defining a second alternative magnetic circuit for communicating said magnetic flux between said pair of magnetic poles, said second magnetic circuit having a second magnetic reluctance and being exclusive of said electrical conductor, one of said first and said second means further including a portion which is movable relative to the remainder thereof between a first and a second relative position for varying one of said first and said second magnetic reluctance, in said first relative position of said movable portion said first magnetic circuit predominating to

communicate substantially all of said magnetic flux flow across said electrical conductor, said movable portion shifting to said second relative position to communicate a substantial portion of said magnetic flux flow via said second magnetic circuit to reduce magnetic flux flow in said first magnetic circuit and thereby to adjust said electromotive force, wherein said first means comprises a rotatable member and a nonrotatable member, said rotatable member carrying said permanent magnet, said nonrotatable member circumscribing said rotatable member and supporting said electrical conductor, said nonrotatable member having said relatively movable portion, said relatively movable portion being shiftable axially between said first position wherein said relatively movable portion is radially congruent with said permanent magnet and said second position wherein said relatively movable portion is substantially out of radial congruence with said permanent magnet.

4,578,610

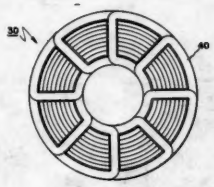
SYNCHRONOUS DISK MOTOR WITH AMORPHOUS METAL STATOR AND PERMANENT MAGNET ROTOR AND FLYWHEEL

Gerald B. Kliman, Schenectady, and Allan B. Plunkett, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 914,191, Jun. 12, 1978, abandoned. This application Jun. 25, 1984, Ser. No. 624,328

Int. Cl.[4] H02K *21/12*

U.S. Cl. 310—156 9 Claims



1. An electrical machine comprising, in combination:

a first ferromagnetic stator body;

a rotor body disposed adjacent said stator body and being rotatable with respect thereto, said rotor body and stator body being separated from one another by an air gap and being magnetically coupled to one another through said air gap;

said stator body comprising a coil of concentric turns of a thin elongated amorphous metal tape wound in the form of an annulus with a central opening;

said stator body annulus having first and second end surfaces, and a plurality of symmetrically distributed slots extending axially across at least a portion of the radial thickness of said first end surface and in a direction perpendicular to the layers of said tape and extending into said annulus for a predetermined depth; and

stator winding means wound in said slots;

said rotor body including a plurality of permanent magnets symmetrically located and circumferentially spaced relative to one another, around the axis of rotation of said rotor body; each of said permanent magnets being magnetized in a direction parallel to said axis of rotation and generally confronting a separate pole, respectively, defined at least in part by said stator winding means wound in said slots.

4,578,611

PIEZOELECTRIC STRESS WAVE TRANSDUCER WITH BORON NITRIDE PIEZO SUPPORT

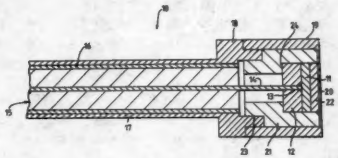
Michael Sadler, Burton-on-Trent, England, assignor to Rolls-Royce Limited, London, England

Filed Jan. 22, 1985, Ser. No. 692,981

Claims priority, application United Kingdom, Mar. 14, 1984, 8406699

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—338 7 Claims



1. A transducer for detecting stress waves comprising a piezo-electric member, an electrically conductive backing member upon which said piezo-electric member is mounted and which is in electrical contact therewith and a boron nitride support member which carries both said piezo-electric member and said backing member, said piezo-electric member being so disposed as to be operationally exposed to stress waves whereby any such stress waves cause said piezo-electric to deform and thereby generate an electrical output, the magnitude of which is indicative of the magnitude of said stress waves.

4,578,612

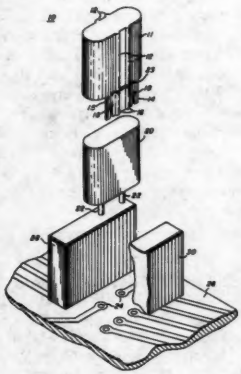
SHOCK ABSORBER AND SPACER FOR QUARTZ CRYSTALS

Charles W. Mooney, Lake Worth, Fla., assignor to Motorola, Inc., Del.

Filed Sep. 14, 1984, Ser. No. 650,484

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—348 9 Claims



1. A shock isolator having an integral spacer for use in conjunction with quartz crystal enclosures or the like having electrical leads, said shock isolator comprising:

a body portion having a shape suitable for substantially covering portions of said crystal enclosure;

springing means, coupled to said body portion, for providing isolation to said crystal enclosure against the shock of impact with nearby structures;

spacing means for spacing said crystal enclosure away from a circuit board by a predetermined distance; and

hinging means for attaching said spacing means to said body portion in a manner which allows said spacing means to be pivoted to a first position to facilitate easy attachment of said crystal enclosure to said body portion and pivoted into an operative position for spacing said crystal enclosure from said circuit board.

4,578,613

DIAPHRAGM COMPRISING AT LEAST ONE FOIL OF A PIEZOELECTRIC POLYMER MATERIAL

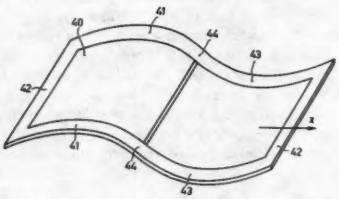
Abe Posthuma de Boer, and Jan W. Vegt, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 888,847, Mar. 22, 1978, abandoned. This application Jan. 24, 1980, Ser. No. 114,858

Claims priority, application Netherlands, Apr. 7, 1977, 7703836

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—800 **11 Claims**



1. An electro-acoustic device comprising a diaphragm which includes at least one foil of a piezoelectric polymer material, at least one pair of electrodes located on opposite sides of said foil so that electric signals on said electrodes are converted into acoustic vibrations and vice versa, the diaphragm being maintained in a curved position under mechanical prestress in the rest conditon such that for every point on the diaphragm surface a first and a second tangential direction can be found, in which the curvatures of the surface are opposite to one another, the curved shape of the diaphragm and the location of the electrodes being arranged so that changes in surface shape in response to said electric signals and the corresponding non-linear conversion into acoustic vibrations of given portions of the diaphragm is combined with similar changes in surface shape of other portions of the diaphragm so that the conversion into acoustic vibrations of the given and other portions for the fundamental wave of the signals augment one another but said given and other portions of the diaphragm provide a compensating effect for the even harmonics of the signals.

4,578,614

ULTRA-FAST FIELD EMITTER ARRAY VACUUM INTEGRATED CIRCUIT SWITCHING DEVICE

Henry F. Gray, Alexandria, Va., and Richard F. Greene, Bethesda, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 23, 1982, Ser. No. 401,277

Int. Cl.⁴ H01J *1/02*

U.S. Cl. 313—309 **7 Claims**

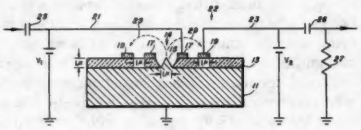
1. An ultra-fast microminiature planar switching device comprising:

an electron-emissive substrate;

an insulating layer formed over a surface of the substrate;

a field-emission cathode comprised by an opening formed in the insulating layer exposing a part of the underlying substrate, with the central region of the exposed underlying material forming a raised emitting tip integral with the underlying substrate;

a gate electrode for control of electron extraction from the field-emission cathode comprised by a first metallization located on the insulating layer and adjacent to the opening;



a collector electrode for collection of substantially all electron emission from the field-emission cathode comprised by a second metallization located on the insulating layer and separated from the first metallization; and

means for supplying an input signal to the gate to cause emission and travel of electrons from the field emission cathode to the collector and for extracting an output signal from the collector.

4,578,615

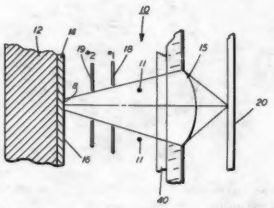
VACUUM FLUORESCENT PRINTING DEVICE EMPLOYING A FLY'S-EYE LIGHT COUPLING METHOD

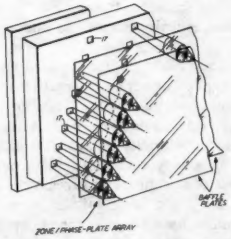
Frank C. Genovese, Fairport, and James W. Lannom, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 1, 1984, Ser. No. 605,731

Int. Cl.⁴ H01J *1/62, 63/06*

U.S. Cl. 313—497 **12 Claims**





1. A vacuum fluorescent printing device adapted for use in conjunction with a moving light sensitive recording media in order to create images from electronically generated data, comprising in combination:

a plurality of cathode filaments;

at least one control grid;

a skewed matrix of addressable phosphor areas arranged on

an anode substrate such that as said phosphor sections are excited by said cathode filaments through said control grid a high resolution array of precisely defined light is directed toward said light sensitive recording media; and

a single curved surfaced fly's-eye lens array adapted to transmit the light from said phosphor areas to said light sensitive recording media, said fly's-eye lens array having lenses that are offset in relation to a vertical plane such that they match said skewed matrix of addressable phosphor areas in order that all points on the surface of said light sensitive recording media can be addressed.

4,578,616

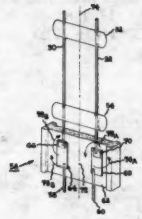
TUNGSTEN HALOGEN INCANDESCENT LAMP HAVING AN IMPROVED MOUNTING STRUCTURE

John G. Cardwell, Jr., Milan, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 7, 1984, Ser. No. 618,179

Int. Cl.[4] H01K *1/22, 1/40*

U.S. Cl. 313—579 **1 Claim**



1. A tungsten-halogen incandescent lamp comprising a tungsten wire planar multi-filament having coiled-like sections joined together by uncoiled sections and further having coiled leg sections, said lamp further comprising a light-transmitting envelope of vitreous material having a pinch seal end and a pair of rigid outer lead-in wires each having one end extending into said envelope, said envelope containing an inert gas along with a halogen additive for providing a halogen atmosphere in the lamp during the operation thereof, said lamp further comprising;

(a) a mounting assembly holding the planar multi-filament in a predetermined central position within the envelope and comprising;

(a_i) A pair of substantially straight support rods extending alongside opposite sides of the planar filament and connected to said coiled leg portions;

(a_{ii}) a pair of insulating bridge cane-like members transversely located between opposite ends of said support members and providing a structure that surrounds the planar filament;

(a_{iii}) coil support members anchored in said bridge cane-like members and engaging said uncoiled segments of said planar filament;

(a_{iv}) means rigidly lodged in said pinch seal end for coupling said rigid outer lead-in wires to said support rod members comprising:

a first foil member and a first tab member, and a second foil member and a second tab member for respectively connecting said one end of each outer lead-in wires extending through said envelope to one end of each support rod members, and

said one end of said outer lead-in-wires being respectively connected to opposite surfaces at one end of said foil members, said respective support members being connected to the same surface of said foil members as their respective outer lead-in wires and at the opposite end of the said foil members by affixing respective support rods to the tab member of the respective foil members.

4,578,617

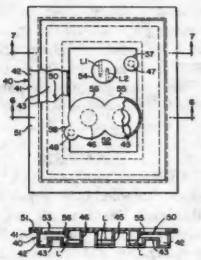
ELECTROLUMINESCENT PANELS

Charles Kerr, III, and Mark Forell, both of E. Aurora, N.Y., assignors to Astronics Corporation, Orchard Park, N.Y.

Filed Nov. 7, 1983, Ser. No. 548,972

Int. Cl.[4] H01J *33/02;* **G09F** *13/22;* **G01D** *11/28*

U.S. Cl. 313—512 **10 Claims**



1. An EL instrument panel, comprising a light transmissive shell having a recess in the back thereof,

an EL lamp element mounted in said recess and having therethrough an opening,

a backing member having thereon a projection extending into said recess in closely spaced confronting relation to said EL element, and

potting material interposed between and permanently fixing together said member and said shell, said potting material extending into and filling the space between said projection and said EL element thereby to form an assembly with said EL element being embedded in said potting material,

said assembly having therethrough an instrument opening which registers with said opening in said EL element, and which is adapted to have an instrument mounted therein so as to be surrounded by said EL element.

4,578,618

LOW-PRESSURE, HOLLOW CATHODE LAMP

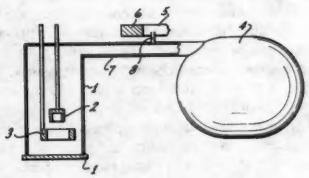
Michael Zöchbauer, Oberursel, Fed. Rep. of Germany, assignor to Hartmann & Braun AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 20, 1980, Ser. No. 161,332

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1979, 2925410

Int. Cl.[4] H01J *61/28, 61/09*

U.S. Cl. 313—563 **3 Claims**



1. A low-pressure, hollow cathode lamp, containing in its interior nitrogen and oxygen for emitting nitrogen oxide molecule resonance radiation, the improvement comprising a quantity of manganese dioxide provided for exposure to the interior of the lamp, for replenishing consumed oxygen by gradually releasing oxygen as bonded in the dioxide.

4,578,619

GLASS COMPOSITION AND GAS-FILLED DISPLAY PANEL INCORPORATING THE GLASS

Ruvim Braude, Elizabeth, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed Jun. 22, 1983, Ser. No. 506,841
Int. Cl.[4] H01J *17/49*
U.S. Cl. 313—586 **3 Claims**

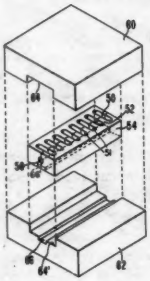
1. A glass composition suitable for joining components of apparatus consisting essentially of about 20% by weight of SiO_2, about 20% by weight of B_2O_3, about 3% by weight of CaO, about 40% by weight of ZnO, about 5% by weight of Al_2O_3, about 7% by weight of Na_2O, about 4% by weight of K_2O, and about 1% by weight of Li_2O.

4,578,620

SLOW WAVE CIRCUIT FOR A TRAVELING WAVE TUBE

Bertram G. James, Redwood City; Frank C. Dinapoli, Saratoga, and Lloyd P. Hayes, San Jose, all of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 371,368, Apr. 23, 1982, abandoned.
This application Jun. 29, 1984, Ser. No. 626,467
Int. Cl.[4] H01J *25/36*
U.S. Cl. 315—3.5 **5 Claims**



1. A coupled-cavity slow-wave circuit comprising:

a first one-piece metallic comb having a first pair of opposed limiting surfaces lying on a pair or parallel side planes, an axis aligned midway between said side planes, said comb further including a generally rectangular elongated backing member extending along the direction of said axis and perpendicular to said side planes, an array of identical vanes of generally rectangular shape, each said vane extending at right angles from said backing member and evenly spaced along said axis, said vanes being of equal length and each terminating in an end forming a rectangular tip, each said rectangular tip of said vanes lying in a symmetry plane containing said axis and perpendicular to said side planes, a groove being formed on each said rectangular tip of said vanes and centered along said axis, said vanes, backing member and opposed limiting surfaces defining therebetween an array of slots;

a second one-pice metallic comb having vanes, a backing member, a groove, slots, and a pair of opposed limiting surfaces which are the mirror image of said vanes, backing member, groove, slots and opposed limiting surfaces of said first comb as mirrored in said symmetry plane;

said first and second combs being aligned on said symmetry plane such that said vane grooves align to form an enclosed electron beam passageway, said a pair of opposed limiting surfaces of said second comb lying on said pair of parallel side planes of said first comb, and said slots align to form an array of openings extending through said pair of opposed limiting surfaces;

a pair of metallic cover members, each having a flat surface, said flat surface of each cover member covering and in electrical contact with a respective one of the pair of opposed limiting surfaces of said combs;

at least one of said cover members having a uniform axial channel disposed in said flat surface;

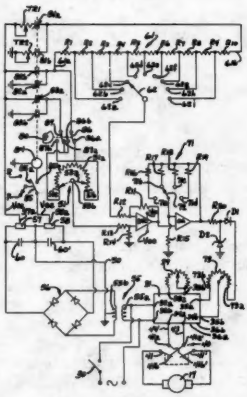
said cover members being bonded to said combs in electrical contact therewith to partially cover and short circuit said openings to form an array of coupled cavities and to form part of a vacuum envelope foe said circuit.

4,578,621

STOCK ADVANCING APPARATUS WITH DANCER OPERATED POTENTIOMETER SPEED CONTROL

Richard D. Nordlof, 3312 Crest Rd., Rockford, Ill. 61107

Filed Dec. 13, 1984, Ser. No. 681,240
Int. Cl.[4] H02P *7/00*; G05B *1/06*
U.S. Cl. 318—6 **17 Claims**

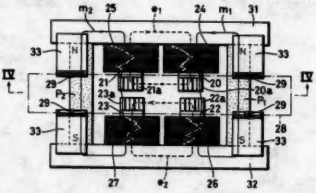


1. A stock advancing apparatus comprising, a support, rotary stock advancing means on the support, an electric drive motor for driving the rotary stock advancing means, motor control means having an output circuit connected to the drive motor and an input circuit, said motor control means being operative to energize and drive the drive motor at a speed correlative with the amplitude of an input voltage applied to its input circuit, a stock loop control arm mounted for swinging movement about an axis through a range of control arm positions, a control voltage divider having a movable contact, means for applying a DC voltage to the control voltage divider, means operatively connecting the movable contact of the control voltage divider to the control arm for movement therewith to produce a control arm voltage at its movable contact correlative in amplitude with the angular position of the loop control arm, reference voltage means for producing a DC reference voltage, and means responsive to said control arm voltage and said reference voltage for applying an input voltage to the input circuit of the motor control means correlative in amplitude with the amount by which the control arm voltage exceeds the reference voltage, and selectively adjustable means for changing the amplitude of the reference voltage to change the angular position of the control arm at which the motor is energized to drive the stock reel.

4,578,622
LINEAR PULSE MOTOR

Hiroshi Nakagawa, and Zenichiro Miwa, both of Mie, Japan, assignors to Shinko Electric Co., Ltd., Tokyo, Japan

Filed Oct. 20, 1983, Ser. No. 543,927
Claims priority, application Japan, Oct. 26, 1982, 57-188843; Nov. 11, 1982, 57-198658
Int. Cl.⁴ H02K *41/00*
U.S. Cl. 318—135 **29 Claims**



1. A linear pulse motor comprising:

(A) a primary body including first magnetic circuit forming means provided with a coil or coils;

(B) a secondary body including second magnetic circuit forming means, one of said primary body and said secondary body being movable relative to the other in one axis of direction;

(C) said primary body and said secondary body being flat in parallel planes to each other;

(D) said first magnetic circuit forming means including plural pole surface portions in one surface in each of which first plural teeth are formed at constant pitch, the groups of the first plural teeth of said plural pole surface portions being shifted from one another in a predetermined order by the pitch length x the reciprocal of the number of said pole surface portions (p/n, where p and n represent the pitch length of the first plural teeth and the number of said pole surface portions, respectively);

(E) said second magnetic circuit forming means including second plural teeth of the same pitch as said first plural teeth of the plural pole surface portions; and

(F) guide means for guiding said one of the primary body and the secondary body movably in said one axis of direction, arranged between said primary body and said secondary body for maintaining the constant air gap between said first plural teeth and second plural teeth;

(G) the axis of said coil or coils around which said coil or coils are wound, being substantially perpendicular to said constant air gap;

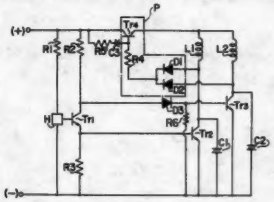
wherein at least one closed magnetic circuit is formed by said first and second magnetic circuit forming means, and said air gap, when said coil or coils are energized in such a mode or order that magnetic attraction occurs between the selected one or ones of the groups of said first plural teeth in said predetermined order, and said second plural teeth of the secondary body for moving said one of the primary body and secondary body by P/n in said one direction, magnetic flux flows through said one closed magnetic circuit and is substantially perpendicular to said air gap in said first magnetic circuit forming means.

4,578,623
BURN-OUT PREVENTIVE CIRCUIT FOR COMMUTATORLESS MOTOR

Seiichi Tsukutani, Sakaiminato, and Naoki Nakada, Tottori, both of Japan, assignors to Matsushita Electric Industrial Co., Osaka, Japan

Filed May 21, 1984, Ser. No. 612,643
Claims priority, application Japan, May 26, 1983, 58-92720
Int. Cl.⁴ H02P *6/02*
U.S. Cl. 318—254 **10 Claims**

1. A burn-out preventive circuit for a commutatorless motor comprising half-wave driven drive windings of two phases, driving power transistors connected in series with said drive windings respectively, position detecting means connected at its output terminal to the bases of said driving power transistors directly or indirectly for alternately turning on said driving power transistors depending on the angular position of rotation of a permanent magnet rotor, a power transistor constituting part of protective means connected in series with said

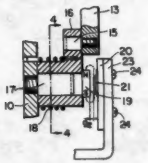


drive windings, and diodes connected at their anodes to the negative power supply terminal side of said drive windings and at their cathodes to the base of said power transistor through a resistor, said power transistor being turned off when the counter-electromotive force induced in the non-energized one of said drive windings while the other is being energized is lower than the predetermined level or zero, thereby interrupting energization of said latter drive winding.

4,578,624
SPEED SETTING ARRANGEMENT FOR SEWING MACHINES

Shigeo Neki, Osaka; Nozomu Shinozaki, and Takashi Dohi, both of Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 601,096, Apr. 17, 1984, abandoned, which is a continuation of Ser. No. 328,635, Dec. 8, 1981, abandoned. This application Jan. 31, 1985, Ser. No. 696,885
Claims priority, application Japan, Dec. 9, 1980, 55-174019
Int. Cl.⁴ H02K *1/22*
U.S. Cl. 318—305 **6 Claims**



1. A speed setting arrangement for a sewing machine, comprising a manually operated pedal, an elongated rotating magnet for generating a magnetic field having magnetic poles located at diametrically opposite positions of a rotary plane defined by said rotating magnet, said magnet being rotatably coupled with said pedal so that the magnet has in said rotary plane a vector component which is oriented in accordance with the angle of rotation of said pedal, and a sensor having a plurality of magnetoresistance elements arranged on a stationary plane parallel with and axially spaced from said rotary plane and lying on and coaxial to the axis of rotation of said magnet, said magnetoresistance elements being arranged in a circuit for generating a signal exclusively in response to the orientation of said magnetic vector component by being in close axial proximity to said magnet such that the resistance of the magnetoresistance elements magnetically saturates, allowing the signal output voltage to exclusively represent the angu-

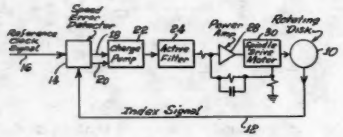
lar orientation of the magnet and thereby the angle of rotation of the pedal despite deviations in axial separation between the magnets and magnetoresistance elements occurring as a result of mechanical wear.

4,578,625

SPINDLE DRIVE CONTROL SYSTEM

Ara W. Nazarian, Hollywood, and Donald G. Stupeck, Canoga Park, both of Calif., assignors to Computer Memories, Inc., Chatsworth, Calif.

Filed Dec. 21, 1983, Ser. No. 563,958
Int. Cl.[4] H02P 5/00
U.S. Cl. 318—318 8 Claims



1. A rotational speed error detection cicuit responsive to externally provided index pulses of frequency representative of rotational speed of a rotating member, comprising:

toggling means for receiving said index pulses and providing alternate index pulses as first toggled index pulses and second toggled index pulses respectively;

first reference time means coupled to said toggling means for providing a first reference time signal a specified reference time after receipt of each first toggled index pulse;

second reference time means coupled to said toggling means for providing a second reference time signal said specified reference time after receipt of each second toggled index pulse;

logic means responsive to said first and second toggled index pulses and said first and second reference time signals for providing a speed up command signal when the time between successive toggled index pulses exceeds said reference time and a slow down command signal when the time between successive toggled index pulses is less than said reference time, the duration of said command signal being proportional to the magnitude of the difference between the time between said successive toggled index pulses and said reference time.

4,578,626

ELECTRICAL CONTROL ARRANGEMENT FOR A ROLLING MILL DRIVE MOTOR OF A ROLLING MILL

Walter Richter, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

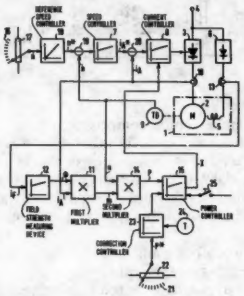
Continuation of Ser. No. 572,825, Jan. 23, 1984, abandoned. This application Mar. 21, 1985, Ser. No. 714,344
Claims priority, application Fed. Rep. of Germany, Jan. 24, 1983, 3302222
Int. Cl.[4] H02P 5/16, 7/00
U.S. Cl. 318—338 5 Claims

1. In an electrical control arrangement for controlling the speed of a rolling mill driving motor having an armature winding and a field winding supplied with electrical current from a supply network, the driving motor being coupled to and driving rolls of a rolling mill for manufacturing hollow blocks, the control arrangement including a speed controller for controlling the speed of the motor, a current controller for controlling the armature winding current coupled to the speed controller, means coupled to said driving motor for determining the actual speed of the motor and means coupled to said armature winding for determining the armature winding current of the motor, said speed controller being coupled to means for generating a reference speed value and said means for determining the actual speed of the motor whereby said speed controller generates a signal proportional to a desired value of the armature winding current, said signal being supplied to said current controller, the improvement comprising:

first means coupled to the field winding for determining the field strength generated by said field winding of the motor;

second means for generating a reference motor power value;

control means comprising first multiplier means coupled to said means for determining the armature winding current and to said first means, for generating, at an output thereof, a signal proportional to the torque developed by said driving motor, second multiplier means coupled to said means for determining the actual speed of the motor



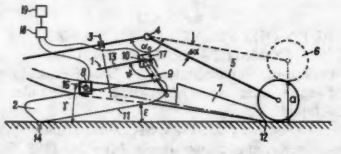
and to the output of said first multiplier means, for developing, at an output thereof, a signal proportional to the actual power developed by said motor, and third means coupled to said second means and to the output of said second multiplier means for comparing the actual value of the motor power with said reference power value to form a control signal, said control signal coupled as a control input to said current controller whereby said current controller maintains the power of said motor substantially constant, and means for selectively deactivating said control means whereby said control arrangement maintains the speed of the driving motor substantially constant, instead of maintaining the power of said motor substantially constant.

4,578,627

DEVICE FOR CORRECTING THE CONTROL OR THE DISPLAY OF THE POSITION OF A CUTTING TOOL OF A CUTTING MACHINE

Bernhard Dröscher, and Alfred Zitz, both of Zeltweg, Austria, assignors to Voest-Alpine Aktiengesellschaft, Muldenstrasse, Austria

Filed Jun. 19, 1984, Ser. No. 622,248
Claims priority, application Austria, Jul. 15, 1983, 2606/83
Int. Cl.[4] E21C 47/00
U.S. Cl. 318—632 9 Claims



1. A device for controlling the angular position of a cutting tool mounted on a cutting machine, the cutting machine being self-propelled and including a loading means for removing cut

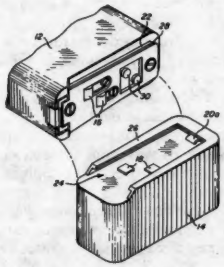
debris having a front end and a rear end and pivotally mounted about a horizontal axis on a frame of the cutting machine spaced from the front end of the loading means, the loading means capable of engaging the ground to stablilize the cutting machine such that the front end of said cutting machine is lifted from the ground, the cutting tool being mounted on an arm pivotally mounted about a horizontal axis on the cutting machine, the cutting tool being capable of engaging the ground, an angular position transmitter means capable of detecting and transmitting a signal indicating the angular position of the loading means relative to the frame, an evaluating circuit means capable of receiving said signal and adjusting the angular position of the cutting tool to maintain a predetermined position.

4,578,628

PORTABLE BATTERY POWERED ELECTRICAL APPARATUS WITH IMPROVED BATTERY PACK PROTECTED AGAINST INADVERTENT SHORT CIRCUIT OF THE BATTERY TERMINALS

Kazimierz Siwiak, Sunrise, Fla., assignor to Motorola Inc., Schaumburg, Ill.

Filed Jan. 4, 1985, Ser. No. 688,950
Int. Cl.[4] H02J 7/00; H01M 2/10; H04B 1/38
U.S. Cl. 320—2 **6 Claims**



1. An improved portable battery operated electrical apparatus, including in combination:

a first housing portion having electrically energized circuitry and components therein supplied operating power through a first set of included supply terminals;

a second housing portion having a battery power source and a second set of normally inactivated battery terminals and switch means for selectively activating said second set of battery terminals;

said first and second housing portions having means for detachably interconnecting the same whereby said second set of battery terminals connected to said battery power source are activated by said switch means only upon interconnection of said housing portions; and

means for preventing the use of battery power sources having battery terminals activated prior to mating with said first housing portion.

2. In a portable battery powered electrical apparatus having a first housing portion for accommodating electrically energized circuitry and components therein through a first set of included supply terminals, said first housing portion further including a second set of fuse terminals connected to an included fuse device, the improvement comprising:

a second housing portion having a battery power source and a third set of normally inactivated battery terminals and switch means for selectively actuating said last named terminals; and

means for detachably interconnecting said second housing portion to said first portion and actuating said switch means to activate said third set of battery terminals only upon said interconnection being fully effected,

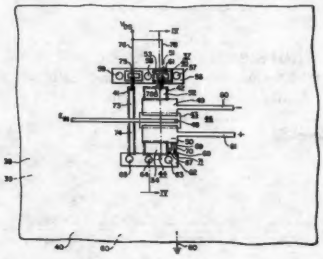
said third set of battery terminals first contacting said second set of fuse terminals to which said fuse device is connected prior to contacting said first set of supply terminals.

4,578,629

MONOLITHIC MICROWAVE "SPLIT LOAD" PHASE INVERTER FOR PUSH-PULL MONOLITHIC FET AMPLIFIER CIRCUITS

James E. Degenford, Ellicott City, and Daniel C. Boire, Ferndale, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 9, 1983, Ser. No. 530,809
Int. Cl.[4] H03F 3/26
U.S. Cl. 323—217 **9 Claims**



1. A phase inverter for generating first and second signals 180 degrees out-of-phase from an input signal, comprising:

a semiconductor substrate,

a field effect transistor in said substrate having a drain and source electrode and a gate electrode therebetween,

a first resistor implanted within sid substrate coupled between said drain electrode and a voltage terminal,

a second resistor implanted within said substrate coupled between said source electrode and a ground terminal,

a compensation capacitor implanted within or layered upon said substrate having interdigitated fingers of a predetermined reactance positioned between said source electrode and said ground terminal,

means for coupling said input signal to said gate electrode,

means for coupling a bias voltage to said gate electrode, and

means for coupling said first and said second signals from said drain and said source electrodes respectively.

4,578,630

BUCK BOOST SWITCHING REGULATOR WITH DUTY CYCLE LIMITING

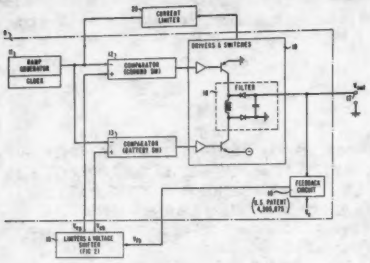
James T. Grosch, Budd Lake, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 23, 1984, Ser. No. 674,162
Int. Cl.[4] G05F 1/46
U.S. Cl. 323—271 **9 Claims**

1. A duty-cycle limited, buck-boost, switching regulator including first and second switches for connecting, with adjustable duty cycle, opposite terminals of an inductance to different ones of terminals for receiving operating voltage and said regulator comprising

first and second means, responsive to a regulator output signal, for developing first and second duty cycle control signals for adjusting duty cycles of said first and second switches, and

means for limiting a voltage difference between said control signals to a maximum value substantially less than a value



corresponding to a maximum range of duty cycle adjustment of one of said switches.

4,578,631

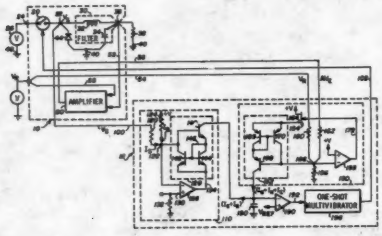
HIGH-SPEED FEEDBACK CIRCUIT

Steve Smith, 5100 Channel Ave., Richmond, Calif. 94804

Filed Jan. 18, 1984, Ser. No. 571,740

Int. Cl.[4] H02M *1/15*

U.S. Cl. 323—282 **15 Claims**



1. A circuit for use with a capacitor and a regulator, the regulator being of the type which includes a switch for developing a switched voltage the level of which varies as a train of pulses, the circuit for stabilizing the average level of the switched voltage at a level designated by the level of a reference voltage, the circuit comprising in combination:

first current developing means for connection to receive the switched voltage, said first current developing means for developing a first current at least a portion of the instantaneous level of which is equal to a predetermined constant times the instantaneous level of said switched voltage;

second current developing means for developing a second current at least a portion of the level of which is equal to a predetermined constant times the reference voltage level, said first and said second current developing means for connection to the capacitor so that said capacitor develops a voltage the magnitude of the level of which is equal to the integral of the level of a current the level of which is equal to the difference between said first and said second currents;

comparator means for connection to said capacitor, said comparator means for developing a voltage the level of which designates when the level of said capacitor developed voltage is at a predetermined voltage level; and

switch driving means for connection to the switch and connected to said comparator means, said switch driving means being responsive to said comparator means developed voltage and operative to drive said switch so as to stabilize the average level of said switched voltage at the level designated by the level of said reference voltage.

4,578,632

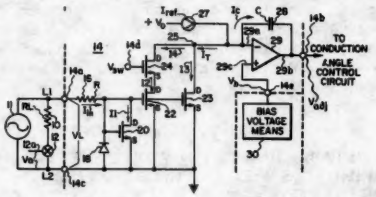
INTERGRATABLE LOAD VOLTAGE SAMPLING CIRCUIT FOR R.M.S. LOAD AVERAGE VOLTAGE CONTROL APPARATUS

William J. Laughton, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 7, 1984, Ser. No. 608,043

Int. Cl.[4] G05F *1/56*

U.S. Cl. 323—315 **20 Claims**



1. An integratable sampling circuit for providing to a control circuit an output signal responsive to the magnitude of the R.M.S. average voltage across a load, which load is connected across an AC source during a portion of the periodic waveform of said source, by conduction of a power switching means responsive to a signal from said control circuit, said sampling circuit comprising:

means for receiving from said control circuit a switching signal having a first level only when said power switching means conducts;

means for converting the instantaneous load voltage magnitude to an input current magnitude;

first current-mirror means for providing a first current at a first fixed multiple of said input current, only during the presence of said first level of said switching signal at said receiving means;

second current-mirror means for providing a second current at a second fixed multiple of said input current;

means for providing a substantially-constant reference current; and

means for integrating, with respect to time, the difference between said reference current and the total of said first and second currents, to provide said output signal.

4,578,633

CONSTANT CURRENT SOURCE CIRCUIT

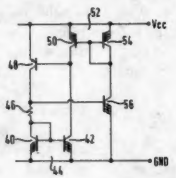
Hidehiko Aoki, Fujisawa, Japan, assignor to Kabushiki Kaisha Toshiba, Japan

Filed Aug. 31, 1984, Ser. No. 646,105

Claims priority, application Japan, Aug. 31, 1983, 58-159264; Aug. 31, 1983, 58-159301

Int. Cl.[4] G05F *3/26*

U.S. Cl. 323—315 **12 Claims**



1. A constant current source circuit adapted to be connected to a voltage source comprising:

first and second transistor devices of a first conductivity type, each having an emitter, base, and collector; said respective emitters being coupled to each other, said respective bases being connected to each other, and said

collector of said first transistor device being connected to said respective bases;

third and fourth transistor devices of a second conductivity type, each having an emitter, base, and collector; said respective emitters being coupled to each other, said respective bases being connected to each other, and said collector of said fourth transistor device being connected to said respective bases, the collectors of said second and third transistor devices being connected;

current supplying means connected in series with said first transistor;

resistance means connected between said current supplying means and said first transistor; and

means for detecting the voltage potential at the connection point between said current supplying means and said resistor and for controlling the current through said first transistor at a constant level by a feedback loop through said fourth and third transistors and said current supplying means.

4,578,634

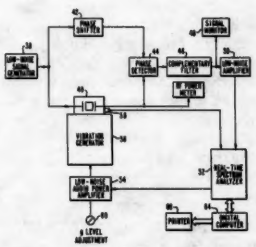
APPARATUS FOR DETERMINING FREQUENCY VERSUS ACCELERATION CHARACTERISTICS FOR CRYSTALS

Daniel J. Healey, III, Baltimore, and Hyo K. Hahn, Columbia, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 499,632, May 31, 1983, abandoned. This application Aug. 29, 1985, Ser. No. 771,151

Int. Cl.[4] G01R *29/22*

U.S. Cl. 324—56 **2 Claims**



1. A system for determining the acceleration induced changes in the electrical characteristics of a crystal, comprising in combination:

(a) circuit means for producing first and second electrical signals each having a fixed frequency and a predetermined phase relationship therebetween;

(b) adjustable phase shift circuit means for coupling said first electrical signal to a first input terminal of a phase detector;

(c) circuit means for coupling said second electrical signal to a second input terminal of said phase detector through said crystal;

(d) means for subjecting said crystal to predetermined mechanically generated acceleration forces having a random frequency within a predetermined bandwidth;

(e) sensor means coupled to said crystal for producing a signal having a predetermined relationship to said mechanically generated acceleration forces;

(f) means for analyzing the output signal of said phase detector and said sensor means to determine the acceleration induced changes in the electrical characteristic of said crystal.

4,578,635

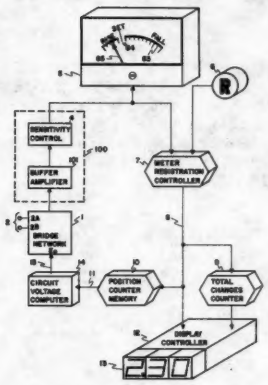
DEVICE FOR MEASURING AND INDICATING CHANGES IN THE RESISTANCE OF A LIVING BODY

John L. Mee, 800 E. Missouri, Apartment #401, Phoenix, Ariz. 85014, and Robert F. Parente, 624 Mulberry St., Plantsville, Conn. 06479

Continuation-in-part of Ser. No. 224,901, Jan. 14, 1981, abandoned. This application Jan. 16, 1984, Ser. No. 570,740

Int. Cl.[4] G01R *27/02;* **A61B** *5/05*

U.S. Cl. 324—62 **10 Claims**



1. An electrical resistance measuring device for measuring and displaying the resistance of a body and changes in resistance thereof, said device comprising in combination:

(a) a bridge network including:

i. a voltage control node;

ii. a first resistance arm having first and second ends, the first end thereof being coupled to a source of ground voltage;

iii. a second resistance arm having first and second ends, the first end of said second resistance arm being coupled to the second end of said first resistance arm at a junction, and the second end of said second resistance arm being coupled to said voltage control node; and

iv. first and second terminals for coupling said body across one of said first and second resistance arms;

(b) amplifier means having an input coupled to one of said first and second terminals for sensing a bridge output voltage thereat, said amplifier means including an output terminal for providing a first output voltage related to said bridge output voltage;

(c) a meter coupled to said output terminal of said amplifier means and responsive to said first output voltage for indicating changes in the resistance of said body, said meter being adapted to display a range of values extending between maximum and minimum predetermined values;

(d) a meter registration controller having an input coupled to said output terminal of said amplifier means for receiving said first output voltage, said meter registration controller including detection means for detecting whether said first output voltage is above a first magnitude corresponding to the maximum value displayed by said meter or below a second magnitude corresponding to the minimum value displayed by said meter and generating increment and decrement signals, respectively, in response thereto, said meter registration controller including an oscillator for providing clock signals;

(e) counter means for storing a digital signal representative of the relative magnitude of the resistance of said body, said counter means being coupled to said detection means and to said oscillator and being responsive to said increment and decrement signals and said clock signals for

incrementing or decrementing said digital signal in response thereto, said counter means including a plurality of output terminals for providing said digital signal; and

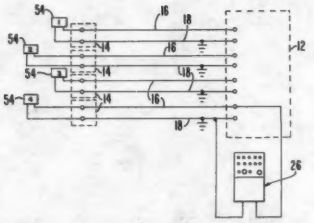
(f) non-linear conversion means having a plurality of input terminals coupled to said plurality of output terminals of said counter means for receiving said digital signal, said conversion means producing an analog output voltage as a non-linear function of said digital signal, said non-linear conversion means including an output terminal coupled to said voltage control node of said bridge network for supplying said analog voltage thereto.

4,578,636

APPARATUS FOR IDENTIFYING WIRES OF MULTIPLE WIRE ELECTRICAL SYSTEM

John S. Bakke, and David C. Bakke, both of 1247 Lorelei Ct., Campbell, Calif. 95008

Filed Nov. 28, 1983, Ser. No. 555,802
Int. Cl.[4] G01R *19/00*
U.S. Cl. 324—66 **4 Claims**



1. Apparatus for identifying a plurality of pairs of wires of a multiple wire electrical system as the wires extend between a central station and respective remote stations with each wire having a pair of opposed ends comprising:

a resistance network adjacent to first ends of said wires, said network including a resistance for each pair wires, respectively, with the resistance being removably connectable to the first ends of the wires of each pair, respectively, and with the resistances being different from each other; and

a control device having a pair of leads for removable connection with the opposite ends of the wires of each wire pair, respectively, said device including an actuatable electrical circuit unit having a plurality of comparators, each comparator having a pair of signal inputs, a signal output or a voltage divider having means for applying first input voltages to first signal inputs of the comparator, there being a voltage input coupled to the second signal inputs of the comparators for sequentially applying voltages thereto representing the signals passing through the resistances of said wire pairs, said circuit further including an observable indicator for each wire pair, respectively, each comparator having a signal output, each observable indicator being coupled to a respective resistance when said voltage input is connected with the opposite end of a wire of respective wire pairs, and means for actuating said circuit.

4,578,637

CONTINUITY/LEAKAGE TESTER FOR ELECTRONIC CIRCUITS

Richard J. Allen, Sunnyvale, and Richard W. Youden, Cupertino, both of Calif., assignors to Signetics Corporation, Sunnyvale, Calif.

Filed Apr. 6, 1984, Ser. No. 597,772
Int. Cl.[4] G01R *15/12*
U.S. Cl. 324—73 PC **11 Claims**

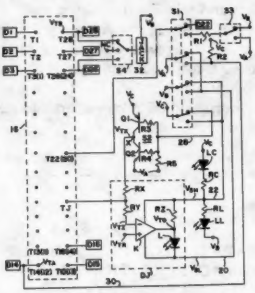
1. A device for testing an electronic circuit having a set of electrical leads of which a first and a second are supply voltage leads, the device comprising:

contact means having test terminals for contacting the leads on a one-to-one basis, a first and a second of the test terminals respectively contactable with the first and second leads;

a supply point;

at least one detection circuit corresponding on a one-to-one basis to at least part of the test terminals, each detection circuit comprising:

a resistor coupled between the supply point and the corresponding test terminal; and



comparing means having a first input terminal coupled to the corresponding test terminal for receiving an input voltage, a second input terminal at a reference voltage V_{TR}, and an output terminal for providing an output signal at one of a pair of opposite states depending on whether the input and reference voltages are in a specified relationship; and

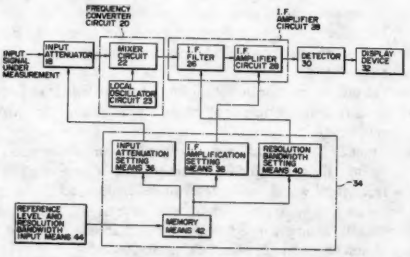
supply switching means for providing the first test terminal with a first test supply voltage V_{TA}, for providing the supply point with a detection supply voltage V_{TX}, and for switching the supply voltages between values suitable for testing continuity at the leads and values suitable for testing current leakage from at least one selected one of the leads to the first lead.

4,578,638

SPECTRUM ANALYZER

Mitsuyoshi Takano, Tokyo, and Mamoru Ando, Hiratsuka, both of Japan, assignors to Anritsu Electric Co. Ltd., Tokyo, Japan

Filed Feb. 23, 1984, Ser. No. 583,020
Claims priority, application Japan, Feb. 27, 1983, 58-31156
Int. Cl.[4] G01R *23/16*
U.S. Cl. 324—77 B **2 Claims**



1. A spectrum analyzer, comprising:

frequency converter circuit means comprising a local oscillator and a mixer coupled to receive an output signal from

said local oscillator circuit and an input signal whose spectrum is to be displayed, for converting said input signal to an intermediate frequency signal;

attenuator means for varying the level of said input signal at input to said mixer circuit;

band-pass filter means coupled to receive said intermediate frequency signal;

intermediate frequency amplifier circuit means for amplifying said intermediate frequency signal after output from said band-pass filter means;

detector circuit means coupled to receive said intermediate frequency signal from said intermediate frequency amplifier circuit means, for producing a detection signal;

display means for displaying said detection signal;

control circuit means comprising memory means for storing a reference level value and a resolution bandwidth value, input attenuation setting means for generating control signals which are applied to said input attenuator means to set the degree of attenuation provided by said input attenuator means such as to establish an optimum level of said input signal under measurement at input to said mixer circuit based upon said stored values of resolution bandwidth and reference level, intermediate frequency amplification setting means for producing control signals which are applied to said intermediate frequency amplifier circuit means for setting the degree of amplification provided thereby such as to correspond, in conjunction with said input attenuation, to said stored reference level value, and resolution bandwidth setting means for producing control signals which are applied to said band-pass filter means for setting the bandwidth thereof to correspond to said stored value of resolution bandwidth; and

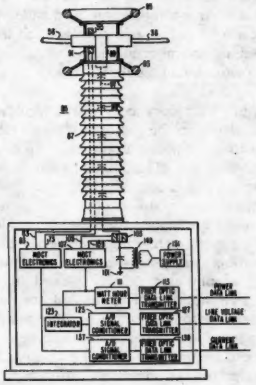
input means for inputting said resolution bandwidth and reference level values to said control circuit means to be stored in said memory means.

4,578,639

METERING SYSTEM FOR MEASURING PARAMETERS OF HIGH AC ELECTRIC ENERGY FLOWING IN AN ELECTRIC CONDUCTOR

Robert C. Miller, Penn Hills Township, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 2, 1984, Ser. No. 585,483
Int. Cl.[4] G01R *21/06, 15/06, 15/07*
U.S. Cl. 324—96 **8 Claims**



1. A metering system for measuring the parameters of high voltage AC electric energy flowing in an electric conductor, comprising:

(a) a magneto-optical material disposed to enclose a current-carrying conductor;

(b) polarizing means for inputting polarized light into the magneto-optical material;

(c) analyzer means for converting the light from the polarizing means to an optical signal of varying intensity in response to the rotation produced in said material;

(d) means including fiber optic and detector means with associated electronic circuitry for providing a first electrical voltage output that is proportional to the current flowing in the conductor;

(e) circuit means including series-connected capacitors extending from the electric conductor to ground and means for providing electrical voltage output which is proportional to electrical current flowing to and from the capacitors generating a second voltage output which is proportional to the rate of change of line voltage with respect to time;

(f) electronic means for receiving input signals including the first voltage output and the second voltage output which signals are converted to produce an output pulse representative of a quantitized amount of electric energy carried by the conductor;

(g) means for receiving the second voltage output from the circuit means and converting it into third voltage outputs;

(h) a first signal conditioner responsive to the third voltage outputs for converting them into conditioned voltage signals; and

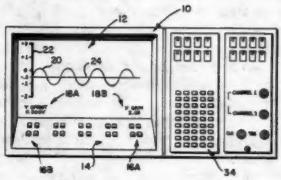
(i) a second signal conditioner responsive to the first voltage output for converting it into conditioned current signals.

4,578,640

OSCILLOSCOPE CONTROL

Arthur W. Crooke, Concord; Colin Gyles, Boxford, and Edwin E. Stebbins, Boston, all of Mass., assignors to Analogic Corporation, Peabody, Mass.

Filed Sep. 14, 1982, Ser. No. 418,187
Int. Cl.[4] G01R *13/20*
U.S. Cl. 324—115 **13 Claims**



1. An oscilloscope receiving a signal to be displayed including:

parameter control and processing means for receiving said signal to selectively adjust a parameter of said signal, said parameter control and processing means including up/down value slewing means and corresponding up/down value slewing switch means coupled thereto having no value criteria immediately thereat, and parameter select means connected to said parameter control means to select at least one parameter from a plurality of signal parameter adjustments, said parameter select means including at least one parameter selection switch means coupled to said parameter select means such that a parameter may be selected by said parameter selection switch means and such that its value may be altered by said up/down slewing switch means;

display means receiving the output of said parameter control and processing means to provide a visual representation thereof; and,

a control panel connected to said parameter control and processing means, said control panel located adjacent to said display means and including said value slewing and parameter selection switch means mounted thereon;

said parameter select means being controllable from said

control panel by said parameter selection switch means, whereby the signal and processing parameter magnitudes are adjusted by said up/down value slewing switch means on said control panel, with the magnitude of the selected parameter being correspondingly indicated on said display means;

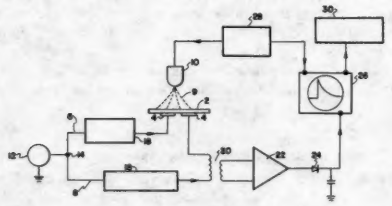
said parameter control and processing means also providing parameter identification signals to said display means so as to generate a corresponding parameter identification image adjacent the displayed magnitude, such that the result of the action taken by said up/down slewing switch means is ascertainable despite the lack of value indication at the up/down slewing switch means.

4,578,641

SYSTEM FOR MEASURING CARRIER LIFETIME OF SEMICONDUCTOR WAFERS

J. Thomas Tiedje, Garwood, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Sep. 24, 1982, Ser. No. 422,669
Int. Cl.[4] G01R *1/04*
U.S. Cl. 324—158 D **11 Claims**



1. A system for measuring the carrier lifetime in semiconductor wafers comprising:

(a) a bridge circuit including a quick disconnect mechanical contact system for capacitively coupling said silicon wafer to said bridge circuit, wherein said wafer is held in position with a vacuum holddown, wherein said bridge consists of two branches, one branch consisting of said capacitively coupled wafer in series with a phase shifter, the other branch consisting of a variable attenuator, the output of said two branches being combined in a transformer,

(b) an A-C signal generator coupled to said bridge through a T connection,

(c) a means for illuminating said wafers with radiation,

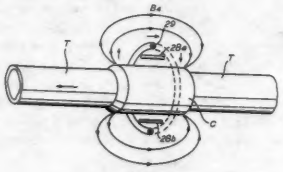
(d) a means for monitoring the output from said bridge circuit.

4,578,642

METHOD AND APPARATUS FOR MEASURING VELOCITY OF FERROMAGNETIC TUBING

Gordon L. Moake, and Marvin Milewits, both of Houston, Tex., assignors to PA Incorporated, Houston, Tex.

Filed Apr. 11, 1984, Ser. No. 599,227
Int. Cl.[4] E21B *47/00*; G01N *27/72*; G01D *3/42*
U.S. Cl. 324—160 **22 Claims**



6. In a method of measuring and locating defects in a tubular element during axial movement, the steps of magnetically saturating a portion of the tubular element to measure the thickness thereof; detecting magnetic flux leakage changes to measure localized defects; applying an additional magnetic field to detect longitudinal defects in the element, the improvement comprising the steps of:

measuring the axial velocity of the element by detecting a first signal dependent upon the axial velocity of the element and upon a moving magnetic field which is variable due to actual displacement of the element and comparing the first signal to a second signal dependent upon the moving magnetic field alone;

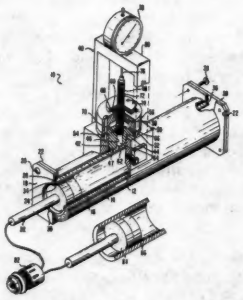
processing said axial velocity to locate said defects.

4,578,643

SIMULATION APPARATUS FOR EDDY CURRENT INSPECTION TECHNIQUES

Warren R. Junker, Monroeville; Bruce J. Taszarek, Mt. Lebanon, and David A. Chizmar, Export, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 18, 1983, Ser. No. 553,346
Int. Cl.[4] G01R *35/00*; G01N *27/82*
U.S. Cl. 324—202 **26 Claims**



1. A simulation apparatus for simulating and analyzing discontinuities in a tube using eddy current inspection techniques, said simulation apparatus comprising:

an inner tubular member and an outer tubular member arranged to define an annular chamber having a predetermined tubular configuration, said outer tubular member having a wall and an opening through the wall, and said inner tubular member including an axially extending hollow interior extending along the axis of said inner tubular member;

a supply of electrically conductive liquid material in said annular chamber, the quantity of said liquid material being such as to substantially completely fill said annular chamber in the vicinity of said opening through the wall of said outer tubular member;

a defect simulation member supported in said opening in said outer tubular member for movement along a predetermined direction extending transverse to said axis of said inner tubular member, said defect simulator member including a simulator portion placed in said electrically conductive liquid material in said annular chamber, said simulator portion having a predetermined configuration corresponding to a predetermined type of discontinuity in a tube and being made at least partially of a material having an electrical conductivity different from the electrical conductivity of said liquid material;

adjustment means for adjusting the position of said simulator portion within said annular chamber along said predetermined direction; and

an eddy current test probe positioned in said hollow interior of said inner tubular member adjacent to the position of said defect simulation member for generating eddy cur-

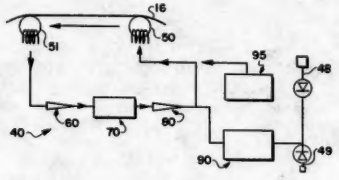
rent responses which are representative of eddy current responses for a tube having a configuration corresponding to said predetermined tubular configuration and having a discontinuity in the wall thereof corresponding to said predetermined type of discontinuity.

4,578,644

METHOD AND APPARATUS FOR TESTING THE PRESENCE OF MAGNETIC STORAGE MEDIUM ON A GIVEN SIDE OF A TAPE

Robert I. Farrow, Burlington, N.C., assignor to American Multimedia, Inc., Burlington, N.C.

Filed Oct. 7, 1983, Ser. No. 540,074
Int. Cl.[4] G01R *33/12*
U.S. Cl. 324—212 **4 Claims**



4. An apparatus for testing tape for the presence of magnetic storage medium on a given side thereof, comprising:

(a) scanning means for scanning a moving tape for the presence of a minimum amount of magnetic noise naturally present on any recording tape resulting from inherent irregularities in magnetic storage medium characteristics to produce a noise signal;

(b) feedback loop means coupled to said scanning means, said feedback loop means including amplifying means for amplifying the noise signal and recording means for recording the amplified noise signal upstream of said scanning means, for repeatedly amplifying said noise signal and recording said noise signal on the tape for a predetermined period of time or until a predetermined signal level is produced on the tape while said tape is scanned by said scanning means;

(c) means coupled to said amplifying means for detecting the amplified noise signal from said amplifying means; and

(d) means coupled to said detection means for indicating the detection of said predetermined signal level within said predetermined period of time to provide a indication of the presence of a magnetic storage medium on the side of said tape contacted by said scanning means, and, for indicating lack of detection of said predetermined signal level within said predetermined period of time to provide an indication of the absence of said magnetic storage medium on the side of said tape contacted by said scanning means.

4,578,645

BOREHOLE LOGGING TOOL UTILIZING ELECTROMAGNETIC ENERGY IN THE DETERMINATION OF DIP OF SUBSURFACE FORMATIONS SURROUNDING A BOREHOLE

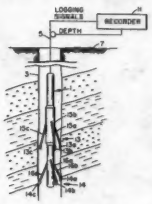
Gustave L. Hoehn, Jr., Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 1, 1984, Ser. No. 576,084
Int. Cl.[4] G01V *3/30*
U.S. Cl. 324—338 **3 Claims**

1. An electromagnetic logging tool for use in the determination of the dip of subsurface earth formations surrounding a borehole, comprising:

a. a borehole tool adapted for movement through said borehole and having at least two antenna arrays positioned at spaced-apart locations along the longitudinal axis of said tool, each of said antenna arrays having at least three antenna sub arrays spaced approximately equally around the longitudinal axis of said tool for transmitting and receiving electromagnetic energy, the three sub arrays of a first of said two antenna arrays being respectively located at approximately the same circumferential positions around the longitudinal axis of said tool as the three sub arrays of the second of said two antenna arrays;

b. means for simultaneously supplying electromagnetic energy to each of said sub arrays of said two antenna arrays for transmitting electromagnetic energy into said earth formations;



c. means coupled to said each of said sub arrays of said two antenna arrays for detecting the amplitudes of the electromagnetic signals returning to each said sub array from said earth formations;

d. means for determining the amplitude differences between the electromagnetic signals received by each of said sub arrays in each of said two antenna arrays to provide at least three amplitude differences for each antenna array; and

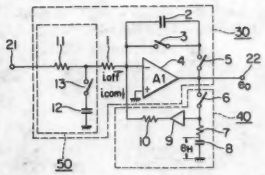
e. means for determining the phase of each of the amplitude differences of said first antenna array with respect to the corresponding amplitude difference of said second antenna array.

4,578,646

INTEGRAL-TYPE SMALL SIGNAL INPUT CIRCUIT

Kenji Maio, Tokyo, and Atsushi Moritani, Kokubunji, both of Japan, assignors to Hitachi, Ltd and Hitachi Medical Corporation, both of Tokyo, Japan

Filed Feb. 8, 1984, Ser. No. 577,972
Int. Cl.[4] H03K *5/01*
U.S. Cl. 328—128 **6 Claims**



1. An integral-type small signal input circuit comprising:

a Miller integrator having an input resistor with its one terminal receiving an input signal, an amplifier connected to another terminal of said input resistor, and an integration capacitor forming a feedback loop of said amplifier during a period of integration; and

an input offset current compensation circuit having voltage hold means and a compensation amplifier and adapted to form a feedback loop of said integration amplifier during a period of compensation between consecutive integration periods and supply a compensation current corresponding to a voltage held in said hold means to the input of said

integration amplifier during said integration period, said input resistor being provided at said one terminal with a low-pass filter which operates during said compensation period, but is released from operation in at least part of said integration period.

4,578,647

AMPLIFIER CIRCUIT

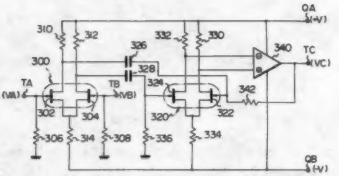
Kouhei Sasamura, Sagamihara, Japan, assignor to Victor Company of Japan, Limited, Kanagawa, Japan

Continuation of Ser. No. 477,808, Mar. 22, 1983, abandoned. This application Aug. 20, 1985, Ser. No. 767,252

Claims priority, application Japan, Mar. 25, 1982, 57-42267[U]

Int. Cl.⁴ H03F *3/16*

U.S. Cl. 330—253 **8 Claims**



5. An amplifier circuit comprising:

a first differential amplifier having a pair of first and second transistors, the gates of which are connected to first and second input terminals respectively, each of the first and second input terminals being supplied with an input signal;

a second differential amplifier having a pair of third and fourth transistors, the gates of which are connected to the drains of the second and first transistors respectively;

an operational amplifier having inverting and non-inverting input terminals which are connected to the drains of the third and fourth transistors respectively; and

a feedback resistor for negatively feeding back an output signal of said operational amplifier to the gate of the fourth transistor of the second differential amplifier such that the output signal of said operational amplifier is inverted by the fourth transistor and the inverted signal is fed to the non-inverting input terminal of said operational amplifier.

4,578,648

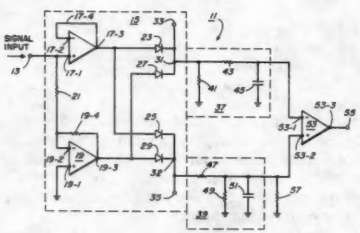
DYNAMIC VERIFICATION GATE CIRCUIT

Donn R. Werrbach, 930 Kaheka St., Honolulu, Hi. 96814

Filed Apr. 16, 1984, Ser. No. 600,723

Int. Cl.⁴ H03G *3/10*

U.S. Cl. 330—281 **7 Claims**



1. A dynamic verification gate circuit for use in controlling the operation of a variable gain control circuit in a system for processing an audio signal, said dynamic verification gate circuit comprising:

a. input means for receiving said audio signal,

b. first means coupled to said input means for generating a pair of equal, absolute value signals representing the "full-wave" rectified versions of said audio signal,

c. second means for generating from one of said absolute value signals a first signal representing the average signal amplitude of said absolute value signal,

d. third means for generating from the other of said absolute value signals a second signal representing the average peak value of said other absolute value signal,

e. comparator means for comparing the first signal and the second signal and generating a third signal corresponding to the comparison of said first and second signals, and

f. output means coupled to the output of said comparator means for outputting said output signal from said comparator.

4,578,649

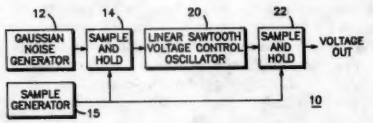
RANDOM VOLTAGE SOURCE WITH SUBSTANTIALLY UNIFORM DISTRIBUTION

Chester D. Shupe, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 4, 1985, Ser. No. 697,991

Int. Cl.⁴ H03B *29/00*; G06F *7/00*

U.S. Cl. 331—78 **14 Claims**



1. A random voltage source with substantially uniform distribution comprising:

a Gaussian noise generator providing an output;

a first sample and hold circuit connected to receive the output from said Gaussian noise generator and provide random voltage samples at an output thereof;

a voltage controlled oscillator having a control input and an output and providing a substantially sawtooth shaped signal at the output with a frequency dependent upon the voltage applied to the control input, the control input being connected to receive the random voltage samples from said first sample and hold circuit; and

a second sample and hold circuit connected to the output of said voltage controlled oscillator and providing a random voltage output.

4,578,650

RESONANCE DRIVE OSCILLATOR CIRCUIT

William S. Watson, Eau Claire, Wis., assignor to Watson Industries, Inc., Eau Claire, Wis.

Filed Jun. 15, 1983, Ser. No. 504,572

Int. Cl.⁴ H03B *5/32*

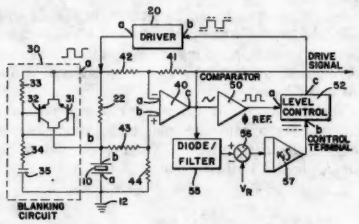
U.S. Cl. 331—160 **12 Claims**

1. Drive circuit apparatus for energizing an actuator mass at its natural resonance, comprising:

(a) drive circuit means arranged and configured for operative connection to an actuator mass, for energizing said actuator mass for movement according to a square-wave drive signal moving between first and second energy levels; said actuator mass producing a periodic actuator output signal when so energized;

(b) sense means operatively connected with said actuator means for sensing said actuator output signal and for providing a sensed signal in response thereto; and

(c) blanking circuit means operatively connected with said sense means for actively blanking said sensed signal at



those transition times when said drive signal moves between said first and said second energy levels.

4,578,651

MAGNETOOPTICAL MODULATOR

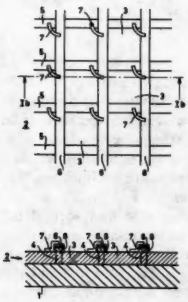
Heinrich Heitmann, Reilingen; Wolfgang Tolksdorf, Tornesch; Fritz Welz, Rosengarten, and Klaus Witter, Hamburg, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 29, 1982, Ser. No. 427,058

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1981, 3139487

Int. Cl.[4] H01S *3/00;* **G11C** *13/06;* **G02F** *1/09*

U.S. Cl. 332—7.51 **12 Claims**



1. A magnetooptical modulator comprising:

a substrate; and

a substantially planar layer of a magnetic material on the substrate, said magnetic material having an easy axis of magnetization perpendicular to the plane of the layer;

characterized in that:

the layer of magnetic material has a number of magnetic domain areas separated from each other by intermediate areas; and

at least a part of at least one intermediate area is electrically conductive.

4,578,652

BROADBAND FOUR-PORT TEM MODE 180° PRINTED CIRCUIT MICROWAVE HYBRID

William G. Sterns, Canoga Park, Calif., assignor to ITT Corporation, New York, N.Y.

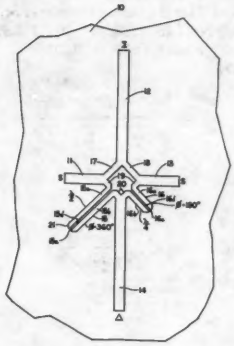
Filed May 14, 1984, Ser. No. 609,614

Int. Cl.[4] H01P *5/19*

U.S. Cl. 333—117 **22 Claims**

22. A four-port TEM mode 180° hybrid for microwave implementation in a pattern of printed circuit form on a dielectric substrate, comprising:

four conductive traces radiating outward from a central portion of said pattern, said traces corresponding to difference, sum, and first and second side ports;



at least two coupled-strip all-pass filter sections each in the form of printed, parallel, closely-spaced conductive traces shorted at their outward ends and associated with said central portion of said pattern in such a way that, for excitation of said difference port, said first and second side ports divide the excitation and maintain a 180° phase relationship over a broad band of frequencies.

4,578,653

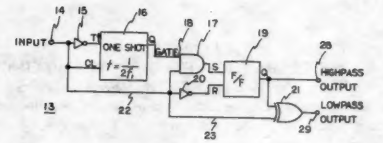
FREQUENCY SELECTIVE FILTER CIRCUIT

Edward K. Howell, Simsbury, Conn., assignor to General Electric Company, Portsmouth, Va.

Filed Jun. 25, 1984, Ser. No. 624,154

Int. Cl.[4] H03D *3/06, 3/18;* **H03H** *11/04*

U.S. Cl. 333—166 **11 Claims**



1. A time domain filter for receiving a symmetrical square wave input signal, said time domain filter comprising in combination:

an input terminal;

a high pass output terminal;

an inverter having an input connected to said input terminal, said inverter having an output;

monostable multivibrator means having a trigger input connected to the output of said inverter, said monostable multivibrator means having an on time which is equal to the half period of a desired low frequency filter cut-off frequency, and said monostable multivibrator means having an output;

an AND gate having one input connected to the output of said multivibrator means and a second input connected to said input terminal, said AND gate having an output, wherein an output from said AND gate is produced when the half wave period of said input signal is less than the on time of said monostable multivibrator means; and

bistable multivibrator means having a set input connected to the output of said AND gate, said bistable multivibrator

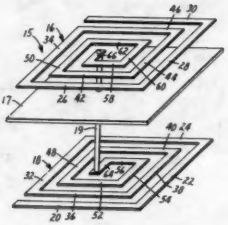
means having an output connected to said high-pass output terminal.

4,578,654

DISTRIBUTED CAPACITANCE LC RESONANT CIRCUIT

William C. Tait, Oak Park Heights, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 16, 1983, Ser. No. 552,305
Int. Cl.[4] H03H *7/01*
U.S. Cl. 333—175 **10 Claims**



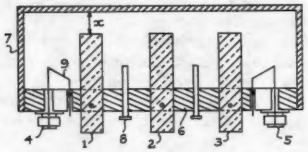
1. A marker for use in an electronic article surveillance system which includes means for detecting a plurality of distinct frequencies, said marker comprising a tuned resonant circuit including a dielectric sheet having on each surface thereof a conductive multi-turn spiral which is substantially identical to the spiral on the opposite surface, each turn of said spirals forming a substantially closed loop positioned in substantial registry with an opposing turn of the spiral on the opposite surface, each of said multi-turn spirals being oppositely wound with respect to the other when both are viewed from the same side of the sheet, and having one predetermined portion in direct electrical contact with an opposing portion of the opposite spiral, said circuit resulting in a series of closed loops having both inductive and distributed capacitive components which in combination resonate at said plurality of distinct frequencies at which eddy currents are minimized and Q-factor is high.

4,578,655

TUNEABLE ULTRA-HIGH FREQUENCY FILTER WITH MODE TM010 DIELECTRIC RESONATORS

Jean-Luc Etienne, Sevres, and Jean-Claude Cruchon, Bouffemont, both of France, assignors to Thomson-CSF, Paris, France

Filed Jan. 10, 1984, Ser. No. 569,712
Claims priority, application France, Jan. 19, 1983, 83 00755
Int. Cl.[4] H01P *1/20*
U.S. Cl. 333—202 **7 Claims**



1. A tuneable ulta-high frequency filter operating in the TM010 mode, comprising:

a rectangular metal case having a base, a lid and a longitudinal axis parallel to said base, said case being and dimensioned to form a below cut-off ultra-high frequency waveguide;

input means, connected to said case, adapted for receiving an ultra-high frequency signal;

output means, connected to said case, for providing an output signal;

a succession of cylindrical, dielectric resonators disposed inside said case in a line parallel to said longitudinal axis, each said resonator having a resonant portion touching said base and an end which is at an adjustable distance from said lid; and

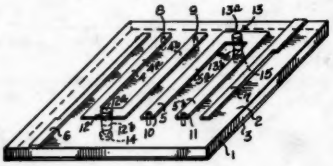
means for adjusting said adjustable distance whereby frequency tuning of said filter may be accomplished and an electromagnetic field in the vicinity of said resonators resonates in the TM010 mode.

4,578,656

MICROWAVE MICROSTRIP FILTER WITH U-SHAPED LINEAR RESONATORS HAVING CENTRALLY LOCATED CAPACITORS COUPLED TO GROUND

Clément-Francois Lacour, Paris, and Patrick Janer, Neuilly sur Seine, both of France, assignors to Thomson-CSF, Paris, France

Filed Jan. 5, 1984, Ser. No. 568,432
Claims priority, application France, Jan. 31, 1983, 83 01454
Int. Cl.[4] H01P *1/203*
U.S. Cl. 333—204 **9 Claims**



1. A microwave filter, comprising:

a dielectric substance having first and second faces;

a ground plane metallized on said second face; and

at least one linear resonator resonant at a resonance frequency F_o having a corresponding resonance wavelength, each said linear resonator including:

a conductor of length L formed on said first face, said conductor having first and second extremities and a center region substantially equidistant between said extremities, said length L being less than one half of said resonance wavelength, said first and second extremities being coupled to said ground plane, said conductor adapted to receive an input microwave signal between said first extremity and said center region, and to provide a filtered microwave signal output between said second extremity and said center region; and

at least one capacitor means, each one of said at least one capacitor means having electrodes which are respectively coupled to said ground plane and to said conductor center region, for tuning said linear resonator to its resonance frequency F_o.

4,578,657

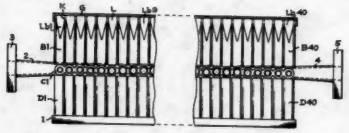
FILTER OF THE TYPE CONSISTING OF A PRIMARY WAVEGUIDE HAVING LATERAL SECONDARY GUIDES

Jean-Claude Cruchon, Bouffemont, and Jean-Denis Schubert, Verneuil sur Seine, both of France, assignors to Alcatel Thomson Faisceaux Hertziens, Levallois Perret, France

Filed May 30, 1985, Ser. No. 739,588
Claims priority, application France, May 30, 1984, 84 08496
Int. Cl.[4] H01P *1/212, 1/22, 1/162, 5/02*
U.S. Cl. 333—211 **4 Claims**

1. A filter comprising a rectangular primary waveguide, n secondary guides, n being a whole number at least equal to 1, said n secondary guides being coupled by one of their ends to

the primary guide via apertures through the wall of said primary guide, and two impedance matchers of the rectangular-guide-to-rectangular-guide coupling type, respectively coupled to the two ends of the primary guides, wherein said n



secondary guides are cylindrical guides and the impedance transformers are provided with rectangular internal cross sections at their extremities having both the height and width whereof smaller on the side coupled to said primary guide than on the side opposite the primary guide.

4,578,658

PROCESS FOR THE PRODUCTION OF AN ULTRA-HIGH FREQUENCY CAVITY RESONATOR AND CAVITY RESONATOR OBTAINED BY THIS PROCESS

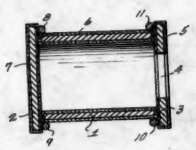
Jacques Urien, Maurepas; Elie Bressan, L'Union; Jacques Danguy, Sartrouville, and Marcel Narzul, Bazemont, all of France, assignors to Thomson-CSF, Paris, France

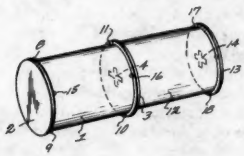
Filed Feb. 21, 1984, Ser. No. 582,230

Claims priority, application France, Feb. 25, 1983, 83 03126

Int. Cl.⁴ H01P *7/06, 11/00*

U.S. Cl. 333—227 **3 Claims**





1. A method of manufacturing an ultra-high frequency cavity resonator comprising a plurality of parts including a hollowed out section, a bottom plate and a cover plate, said method comprising the steps of:

separately manufacturing said plurality of parts out of metal having a low expansion coefficient;

depositing on each of said plurality of parts at least one layer of a metal having good electricity conducting characteristics;

positioning said plurality of parts so as to define a cavity resonator assembly, and maintaining said assembly by positioning means;

submitting this assembly to a temperature elevation sufficiently high to produce melting of said layers of metal; and

slowly cooling said assembly.

4,578,659

COUPLING SYSTEM BETWEEN AN ELECTROMAGNETIC SWITCH APPARATUS AND AN AUXILIARY CONTACT BLOCK RELEASABLY MOUNTED THEREUPON

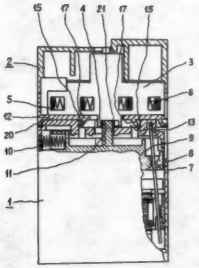
Heinz Suter, Aarau, and Alex Blum, Unterentfelden, both of Switzerland, assignors to Sprecher & Schuh AG, Aarau, Switzerland

Filed Nov. 15, 1984, Ser. No. 672,110

Claims priority, application Switzerland, Nov. 28, 1983, 6338/83

Int. Cl.⁴ H01H *51/06*

U.S. Cl. 335—131 **5 Claims**



1. A coupling system with a first part which is connected to an electromagnetic switch apparatus and with a second part which is connected to an auxiliary contact block releasably mounted on said switch apparatus in order to connect the casing (7) of the switch apparatus (1) with the auxiliary contact block (2) and in order to actuate an auxiliary contact carrier slidingly supported in the auxiliary contact block and which has a coupling member projecting out of said contact block, wherein this actuation is performed through a catch which projects out of the casing of the switch apparatus and which, upon actuation of the switch apparatus is displaced parallel to the bearing surface of the auxiliary contact block (2) on said casing, wherein said catch is located in a rectangular through (13) of the casing (7) of the switch apparatus (1), and wherein a coupling member (4) which is operatively connected to the catch projects into said trough, and wherein the two edges of the trough which extend transversally relative to the direction of movement of the catch are provided with a plurality of tooth-shaped projections projecting into the trough opening in order to connect the casing with the auxiliary contact block (2), wherein the distances between the teeth are larger than the width of the teeth, wherein dogs are integrally formed at the bottom of the auxiliary contact block, these dogs (17, 18) having at least approximately the same width and mutual distances as the projections (15, 16) in order to fit under these projections when the coupling system is locked, and in order to release the casing (1) from the auxiliary contact block (2) when said coupling system is unlocked by a shift of the casing relative to the auxiliary contact block in a direction transversal to the movement of the catch.

4,578,660

HOUSING FOR AN ELECTROMAGNETIC RELAY

Koji Hanada; Yuji Kinoshita, and Masaru Tamura, all of Suzaka, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

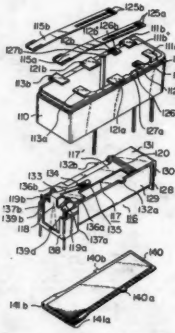
PCT No. PCT/JP81/00210, § 371 Date Apr. 21, 1982, § 102(e) Date Apr. 21, 1982, PCT Pub. No. WO82/00918, PCT Pub. Date Mar. 18, 1982

PCT Filed Sep. 1, 1981, Ser. No. 375,030

Claims priority, application Japan, Sep. 1, 1980, 55-124078; Sep. 26, 1980, 55-136839; Oct. 29, 1980, 55-154365; Feb. 25, 1981, 56-26536

Int. Cl.⁴ H01H *63/02*

U.S. Cl. 335—133 **19 Claims**



1. In an electromagnetic relay in which an electromagnet assembly, having at least a core, a coil bobbin on which a coil is wound and an armature, is accommodated in a box-shaped insulated housing which has surrounding walls to hold fixed contact spring terminals and moving contact spring terminals, the improvement comprising:

said insulated housing has upper and lower surfaces which are open;

said coil bobbin has a flange;

said electromagnet assembly is incorporated into said insulated housing through the lower surface opening and includes accommodation means, having a portion that is molded on the outer surface of the flange of said coil bobbin as a unitary structure, for rotatably holding said armature, with said armature and said core being supported by said coil bobbin; and

said electromagnetic relay further comprises a bottom plate that is fitted to the lower surface opening of said insulated housing and covers said electromagnet assembly.

4,578,661

METHOD OF MANUFACTURING A CATHODE RAY TUBE AND DEVICE FOR CARRYING OUT THIS METHOD

Lambertus J. J. van Rijsewijk; Mario L. Thomas; Henricus J. J. C. Meijer, and Ronald van der Wilk, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

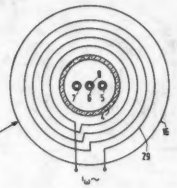
Filed Jan. 7, 1985, Ser. No. 689,541

Claims priority, application Netherlands, Oct. 12, 1984, 8403112

Int. Cl.⁴ H01F *7/00*

U.S. Cl. 335—212 **5 Claims**

1. A method of manufacturing a cathode ray tube in which at least one electron beam is generated by means of an electron gun system in the neck of the envelope and magnetic poles are provided around the said electron beam and generate a permanent multipole magnetic field, said poles being formed by magnetizing a configuration of magnetizable material provided around the electron beam, said configuration being magnetized by energizing, by means of a combination of currents, a multipole coil unit with which a static multipole magnetic field is generated and the magnetization is produced by means of a decaying alternating magnetic field which initially drives the magnetizable material on both sides of the hysteresis curve into



magnetization, characterized in that the decaying alternating magnetic field is an axial magnetic field which is substantially parallel to the electron beam or beams.

4,578,662

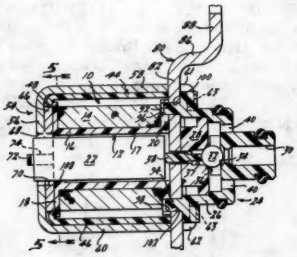
SOLENOID ASSEMBLY

Michael Slavin, Troy, and Ellsworth S. Miller, Mt. Clemens, both of Mich., assignors to Lectron Products, Inc., Rochester, Mich.

Filed Oct. 11, 1984, Ser. No. 659,898

Int. Cl.⁴ H01F *7/08*

U.S. Cl. 335—262 **30 Claims**



1. In a solenoid of the type having an electrical coil including a bobbin formed with a central bore, and a longitudinally movable armature mounted in said bore with circumferential sliding clearance therebetween, the improvement comprising

flux collector means defining a flow path for magnetic flux around said coil,

said flux collector means having laterally spaced longitudinal members at opposite sides of said coil and transverse members at opposite ends of said coil,

at least one of said transverse members overlying said central bore at one end of said bobbin,

said one transverse member being formed with an opening having the same cross-sectional configuration as said armature through which the latter is projectable by energization of said coil,

said opening being slightly larger than said armature to provide annular clearance around the latter in the projected position and to define an air gap between said one transverse member and said armature which is essentially narrow to minimize resistance to flow of magnetic flux between the armature and said one transverse member;

first positioning means interconnecting said bobbin and said transverse members holding said central bore and said opening disposed essentially concentrically with respect to each other; and

second positioning means interacting between said bobbin and said armature supporting the latter at circumferentially spaced points to compensate for out-of-roundness of

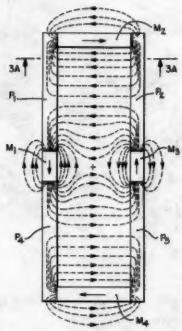
said bore and for maintaining said air gap of relatively uniform width throughout its circumference.

4,578,663

MAGNETIC ASSEMBLY

Thomas C. Sanders, Palo Alto, Calif., and Wynne Calvert, Iowa City, Iowa, assignors to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Nov. 29, 1984, Ser. No. 676,503
Int. Cl.[4] H01F 7/02
U.S. Cl. 335—306 8 Claims



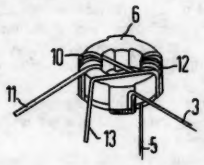
1. A magnetic assembly comprising four magnets and four flux-carrying polepieces arranged to define a working volume of magnetic flux, said magnets being in series-opposed disposition with respect to each other, each polepiece providing a flux path into said working volume for magnetic flux from like poles of two of said magnets, magnetic flux being distributed substantially uniformly in a major portion of said working volume.

4,578,664

RADIO INTERFERENCE SUPPRESSION CHOKE WITH A LOW LEAKAGE FIELD

Hans Kinzler, and Jürgen Kaiser, both of Regensburg, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 498,882, May 27, 1983, abandoned. This application Jul. 29, 1985, Ser. No. 761,295
Claims priority, application Fed. Rep. of Germany, Jun. 2, 1982, 3220737
Int. Cl.[4] H01F 27/30
U.S. Cl. 336—90 1 Claim



1. Radio interference suppression choke with a low leakage field, comprising;

an electrically insulated ferrite ring core;

a first winding having first and second series-connected winding sections wound directly on said core diametrically opposite each other;

an annular one-piece insulating cup disposed on said core and on said first winding; and

a second winding having first and second series-connected winding sections wound on said cup diametrically opposite each other;

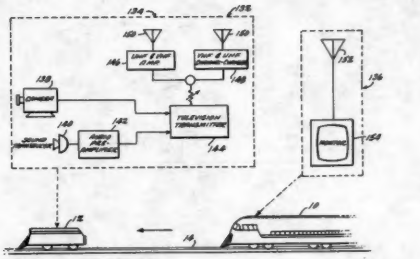
said first and second windings being offset relative to each other by substantially 90°, forming a double choke and said cup having segments of enlarged cross section and width disposed on and spanning said winding sections of said first winding and segments of reduced cross section supporting said winding sections of said second winding.

4,578,665

REMOTE CONTROLLED SURVEILLANCE TRAIN CAR

Tai-Her Yang, Post Office Box 84-85, Taipei, Taiwan

Continuation-in-part of Ser. No. 372,830, Apr. 28, 1982, abandoned. This application May 31, 1984, Ser. No. 615,576
Int. Cl.[4] B61L 15/00
U.S. Cl. 340—48 14 Claims



1. A system for surveying railway tracks disposed a distance away from a train adapted for travelling rectilinearly along said tracks, said system including:

a satellite car also adapted for travelling rectilinearly along said tracks, said satellite car including:

drive means for propelling said satellite car along said tracks;

control means, adapted to receive control signals transmitted by said train and operatively connected to said drive means, for maintaining said satellite car a predetermined distance from said train;

audio detecting means for detecting the level of sound energy produced by the travel of said satellite car over said tracks; and

first transmitting means for transmitting information to said train, said information comprising at least said detected sound energy level to said train;

second transmitting means, disposed on said train, for transmitting said control signals to said control means;

receiving means disposed on said train for receiving said information transmitted by said first transmitting means; and

display means disposed on said train for displaying said received information.

4,578,666

METHOD OF COMPARING DATA WITH ASYNCHRONOUS TIMEBASES

Russell Y. Anderson, Hillsboro, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Mar. 23, 1983, Ser. No. 478,115
Int. Cl.[4] G06F 7/02; G05B 1/00
U.S. Cl. 340—146.2 4 Claims

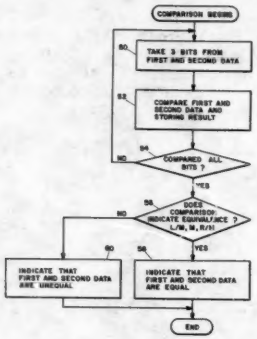
1. A method of comparing first and second data signals each comprising a sequence of digital bits acquired asynchronously, comprising the steps of:

(a) storing said first data signal in a first memory and said second data signal in a second memory;

(b) taking a predetermined number of bits of said first data signal from said first memory and a same number, not less

than two, of corresponding bits of said second data signal from said second memory;

(c) obtaining a relationship of the bits taken from said first and second memories by comparing said bits of said first data signal directly with said corresponding bits of said second data signal, by shifting said bits of said first data signal to the left with respect to said corresponding bits of said second data signal and performing a comparison therebetween, and by shifting said bits of said first data


COMPARISON BEGINS
TAKE 3 BITS FROM FIRST AND SECOND DATA
COMPARE FIRST AND SECOND DATA AND STORING RESULT
COMPARED ALL BITS ?
NO
YES
DOES COMPARISON INDICATE EQUIVALENCE ? L/M, M, R/H
NO
YES
INDICATE THAT FIRST AND SECOND DATA ARE UNEQUAL
INDICATE THAT FIRST AND SECOND DATA ARE EQUAL
END

signal to the right with respect to said corresponding bits of said second data signal and performing a comparison therebetween;

(d) repeating steps (b) and (c) by successively shifting one bit at a time over said sequence of bits of said first and second data signals; and

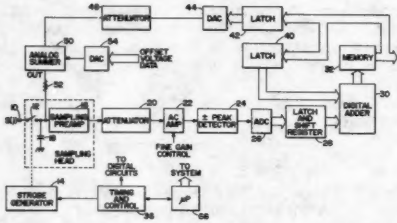
(e) determining the equivalence of said first data and said second data in accordance with obtained relationships of said bits.

4,578,667

DIGITAL ACQUISITION SYSTEM INCLUDING A HIGH-SPEED SAMPLING GATE

Allen L. Hollister, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Mar. 23, 1984, Ser. No. 593,010
Int. Cl.[4] H03M *13/00*
U.S. Cl. 340—347 SH **19 Claims**



1. A method of generating a representation of a waveform, comprising the steps of:

producing analog samples proportional to the magnitude of an input waveform at preselected time points therealong;

converting said samples to digital representations thereof;

storing said digital representations in storage locations associated with said preselected time points of said samples; and

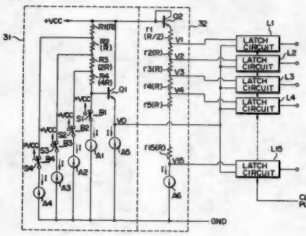
selectively retrieving said digital representations from a storage location associated with the next time point to be sampled and converting said stored digital representations to analog values to provide magnitude estimators for use in producing said samples.

4,578,668

DECODER FOR A D/A CONVERTER

Yasuhiro Sugimoto, Yokohama, Japan, assignor to Shibaura Denki Kabushiki Kaisha Horikawa Cho Sai Wia Kawasaki, Japan

Filed Mar. 30, 1984, Ser. No. 595,439
Claims priority, application Japan, Mar. 31, 1983, 58-55963
Int. Cl.[4] H03M *1/76*
U.S. Cl. 340—347 DA **7 Claims**



1. A decoder for a D/A converter which is responsive to digital input signals comprising:

a first resistor circuit for D/A conversion connected between a first power source and a second power source, said first resistor circuit including a first series resistor path constituting a plurality of first resistors connected in series, a first end of said first series resistor path being connected to said first power source and a second end of said first series resistor path forming a first voltage output terminal;

a first constant current source circuit containing a plurality of constant current sources which are each associated with a different one of said first resistors in said first resistor circuit and coupled to said associated resistor and said second power source;

a plurality of switches each connected between a different one of said first resistors in said first resistor circuit and said associated constant current sources in said first constant current source circuit, said switches each receiving a different one of said digital input signals to selectively connect said first resistors to said associated first constant current sources according to the logic state of the corresponding digital input signal;

a first transistor circuit including a first transistor having a base connected to said first voltage output terminal of said resistor path and having an output path which is connected at one end to said first power source;

a second constant current source circuit including a second constant current source connected between the other end of said output path of said first transistor and said second power source;

a second transistor circuit including a second transistor having a base connected to said first power source and to one end of an output path;

a second resistor circuit for reference voltage generation provided between the other end of said output path of said second transistor in said second transistor circuit and said second power source, said second resistor circuit including a second series resistor path including a plurality of second resistors connected in series between said other end of said second transistor output path and said second power source; and

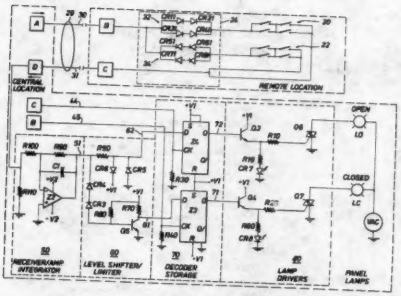
a third constant current source circuit including a third constant current source connected between said second series resistor path of said second resistor circuit and said second power source.

4,578,669

REMOTE SWITCH POSITION INDICATOR

Allan O. Woods, Houston, Tex., assignor to Hydril Company, Los Angeles, Calif.

Filed Sep. 12, 1983, Ser. No. 530,962
Int. Cl.[4] G08B *26/00*
U.S. Cl. 340—518 22 Claims



1. An indicator system for remotely sensing and indicating first and second status conditions of a two state element comprising:

a first switch means responsive to the two state element for closing when the element is in a first state and for opening when the element is in a second state,

a second switch means responsive to the element for opening when the element is in a first state and for closing when the element is in a second state,

a first diode means connected in series with the first switch means for conducting only current of a first direction through the closed first switch means,

a second diode means connected in series with the second switch means for conducting only current of a second direction through the closed second switch means,

the first diode-first switch series connection connected in parallel with the second diode-second switch series connection forming a parallel connection,

a first conductor connected to one end of the parallel connection and a second conductor connected to the other end of the parallel connection, the first and second conductors extending from the location of the remotely disposed element to a central location,

circuit means disposed at the central location for applying a driving oscillating signal that is substantially symmetrical about a reference level to the first conductor,

circuit means disposed at the central location responsive to half cycles of a first direction on the second conductor for generating a first continuous output signal indicative that the element is in the first state, and

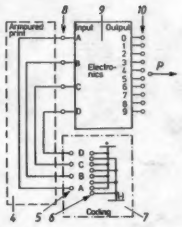
circuit means disposed at the central location responsive to half cycles of a second direction on the second conductor for generating a second continuous output signal indicative that the element is in the second state.

4,578,670

ALARM SYSTEM FOR SAFEGUARDING AGAINST THE BREAK-THROUGH OF A SURFACE

Poul R. Joergensen, Strandvej 14, 4573 Hoejby Sjaelland, Denmark

PCT No. PCT/DK82/00063, § 371 Date Mar. 4, 1983, § 102(e) Date Mar. 4, 1983, PCT Pub. No. WO83/00246, PCT Pub. Date Jan. 20, 1983
PCT Filed Jul. 6, 1982, Ser. No. 485,126
Int. Cl.[4] G08B *13/08*
U.S. Cl. 340—550 11 Claims



1. An alarm system for safeguarding against the break-through of a wall comprising:

a network of electrically conducting wires distributed over the wall and arranged to lie in at least two layers which are spaced a small distance from each other; said wires comprised of a group consisting of a predetermined number of wires running uninterrupted through the layers; each wire having an input terminal and a corresponding output terminal; the input terminals provided with respective set input voltages or signals; the respective set input voltages or signals producing corresponding set output voltages or signals on corresponding output terminals when the alarm system is set and unactivated; at least one of the input terminals being provided with a set input voltage or signal which is different from the set input voltage or signal of at least one of the other input terminals; and electronic means connected to the output terminals for activating an alarm when the output voltage or signal on at least one of the output terminals does not correspond to the set output voltage for that terminal.

4,578,671

REMOTE INDICATING LOW BATTERY VOLTAGE ENUNCIATOR METHOD AND APPARATUS

Dale R. Flowers, Raleigh, N.C., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Dec. 5, 1984, Ser. No. 678,434
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—636 5 Claims

1. Low power supply voltage warning apparatus for a remote, self-contained power supply keyboard data input device, comprising:

voltage monitor means connected to the self-contained power supply voltage;

an internal reference voltage circuit driven by said power supply;

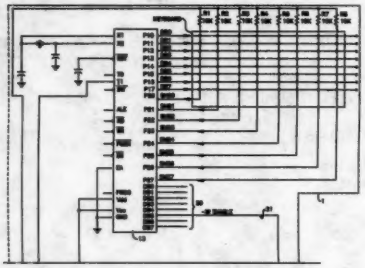
code generator means connected to said voltage monitor means for generating a low voltage indication code;

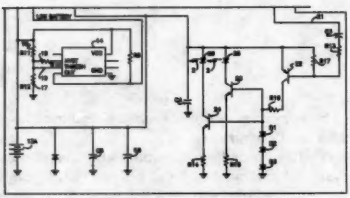
transmitter means connected to said code generator means for transmitting said low voltage indication code; and

transmitter means connected to said code generator means for transmitting said low voltage indication code; and

means connected to said code generator and to said transmitter for controlling issuance of said low voltage indication code to occur during times when said data input keyboard is in use for data input;

receiver means for receiving said low voltage indication code; and





decoding and display means connected to said receiver means for displaying a low voltage warning when said indication code is received.

4,578,672

COLOR LIQUID CRYSTAL DISPLAY DEVICE

Makoto Oota; Masamichi Nekozuka, both of Kanagawa, and Kikuji Yagishita, Tokyo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

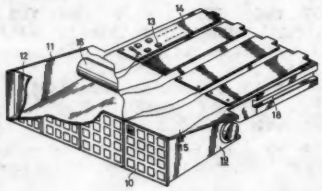
PCT No. PCT/JP82/00394, § 371 Date May 31, 1983, § 102(e) Date May 31, 1983, PCT Pub. No. WO83/01332, PCT Pub. Date Apr. 14, 1983

PCT Filed Sep. 29, 1982, Ser. No. 499,768

Claims priority, application Japan, Sep. 30, 1981, 56-155967

Int. Cl.⁴ G09G *3/36*

U.S. Cl. 340—702 **10 Claims**



1. A large screen color liquid crystal display device, which comprises a number of modules which are connected to one another to form said large screen liquid crystal display device, each said module comprising:

a housing;

a plurality of adjacent liquid crystal panels which are arranged on the front surface of said housing, each liquid crystal panel comprising a plurality of liquid crystal picture elements, each said picture element including at least two electrodes which are different in electrode area from each other and are electrically independent, a plurality of color filters arranged in correspondence to said electrodes, a common electrode confronting said independent electrodes, and liquid crystal interposed between said common electrode and said independent electrodes, and polarizing plates,

printed circuit boards including drive circuits for driving said liquid crystal panels, respectively, said printed circuit boards being arranged longitudinally of said housing, and

a fluorescent lamp arranged inside said housing and in parallel with said adjacent liquid crystal panels.

4,578,673

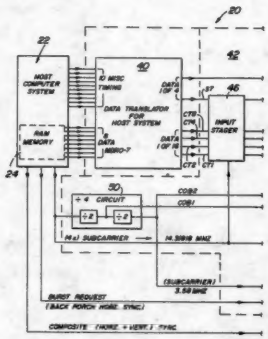
VIDEO COLOR GENERATOR CIRCUIT FOR COMPUTER

Peter N. Yianilos, Fort Lauderdale, Fla., and Michael L. Wajda, Philadelphia, Pa., assignors to Franklin Computer Corporation, Cherry Hill, N.J.

Filed Jul. 8, 1983, Ser. No. 512,284

Int. Cl.⁴ G09G *1/28*

U.S. Cl. 340—703 **5 Claims**



1. Color video generation means for use with a digital computer and a color video display, said color video display comprising a receiver having a phase demodulator operating at a color subcarrier frequency, said computer producing first digital data signals, each of which is composed of plural bits and representing a respective predetermined color out of a pallet of plural colors, said color video generation means producing one of said plural colors in a predetermined area of said display in response to receipt of a predetermined one of said first data signals, said video generation means operating on a color subcarrier signal composed of three primary color signals and comprising translator means, video phase modulator means, and output means, said translator means comprising first addressable memory means and being responsive to said first data signals for producing second, plural bit digital signals, said video phase modulator means comprising second addressable memory means and timing means, said timing means providing digital timing signals to respective first portions of plural predetermined addresses of said second addressable memory means to establish consecutive portions of one complete cycle of said color subcarrier signal, said second digital signals being provided to respective second portions of said plural predetermined addresses, said second addressable memory means having saturation data stored therein at memory locations corresponding to said plural predetermined addresses, said saturation data defining at least three predetermined different amounts of the primary color signals present in each of said consecutive portions of the cycle of the color subcarrier signal, said second addressable memory means operating in synchronism with said phase demodulator to provide respective output signals during said consecutive portions of said one complete cycle of said color subcarrier signal, each of said output signals consisting of said saturation data stored within the memory location addressed, said output signals

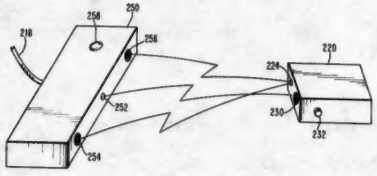
being converted by said output means into analog signals, each of which represents the level of saturation of the three color signals making up the color subcarrier signal during each of said consecutive portions of said color subcarrier, said output signals being arranged for combination with video synchronization signals and a color burst signal to provide a composite video signal suitable for use by said phase demodulator.

4,578,674

METHOD AND APPARATUS FOR WIRELESS CURSOR POSITION CONTROL

David C. Baker, Austin, Tex.; David F. Bantz, Chappaqua, N.Y., and Gregory A. Flurry, Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 20, 1983, Ser. No. 486,630
Int. Cl.⁴ G09G *1/00*
U.S. Cl. 340—710 **8 Claims**



1. Apparatus for controlling the motion of a cursor on a screen comprising:

a wireless cursor position control device with an infrared detector for detecting a first signal transmittal from a control base and an ultrasonic emitter for transmitting a second signal generated in response to said detected first signal,

a control base with one or more infrared emitters for transmitting signals to said first detector in said cursor position control device and a plurality of ultrasonic detectors for receiving signals from said ultrasonic emitters in said cursor position control device, and

means to calculate the relative motion of a cursor from said directions and velocity of said cursor position control device.

4,578,675

APPARATUS AND METHOD FOR LOGGING WELLS WHILE DRILLING

Norman C. MacLeod, San Jose, Calif., assignor to MacLeod Laboratories, Inc., San Jose, Calif.

Filed Sep. 30, 1982, Ser. No. 429,823
Int. Cl.⁴ G01V *1/00, 3/10*; E21B *29/02*
U.S. Cl. 340—855 **18 Claims**

1. Information while drilling apparatus for detecting electrical data reflective of geological conditions generally ahead of a drill bit in a well and communicating such data to ground surface via an electrically conductive drill string comprising:

excitation source means for inducing alternating electrical excitation currents to flow through earth strata surrounding the drill bit;

an elongated, electrically conductive, cylindrical module forming a drill collar means connected in the drill string proximate said drill bit at the lower end of said drill string having,

a passive current sensing means disposed at the lower end of said module for detecting excitation currents flowing to and from earth strata generally adjacent to and anead of the drill bit through said drill bit and for developing corresponding logging signals,

a first detecting means responsive to said logging signals and

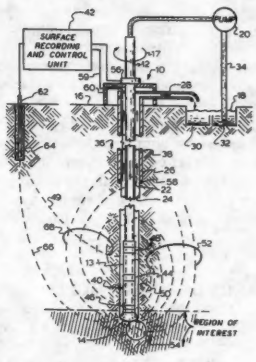
operative to develop corresponding first data signals, and

a first signal coupling means for coupling said first data signals into said drill string; and

communication means coupled to said drill string for receiving said first data signals;

a bi-directional remote coupler means including, an electrically conductive cylindrical coupler housing forming a part of said conductive drill string above the module;

a remote relay toroidal transformer means encircling a cross-sectional area coaxially within said coupler housing and having one lead of its toroidal winding electrically connected to said coupler housing;



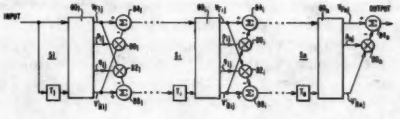
an insulated conductor of predetermined length electrically connected between the other lead of the toroidial winding and a wiper contactor contacting said module at a point below said first signal coupling means, said first signal coupling means inducing said data signals in said insulated conductor, said conductor communicating the data signals to said remote relay toroidal transformer means which in turn couples said data signals into said drill string.

4,578,676

DELAY LATTICE FILTER FOR RADAR DOPPLER PROCESSING

Earnest R. Harrison, Jr., Severna Park, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 26, 1984, Ser. No. 604,331
Int. Cl.⁴ G01S *7/28, 13/52, 13/00*
U.S. Cl. 343—17.1 R **7 Claims**



1. In a pulse doppler radar signal processor which processes successive echo interpulse period (IPP) signalling in accordance with range cell samples, an adaptive filter for enhancing the discrimination of targets from clutter and noise, said filter having a delay lattice configuration including a plurality of cascadedly coupled lattice stages, each adapted to operate on the range cell samples of first and second complex signal inputs, a lattice stage comprising:

means for delaying said second complex signal input over a time interval to render the delayed range cell samples thereof, corresponding to a previous IPP, coherent with the range cell samples of said first complex signal input corresponding to a current IPP;

means for computing independently a first coefficient signal and a second coefficient signal for each range cell sample of said current IPP based on respective separate functions of a common multiplicity of coherent range cell samples of said first and delayed second complex signal inputs, said common multiplicity of coherent range cell samples being grouped about said range cell sample for which said first and second coefficient signals are being computed;

first means for weighting each range cell sample of said first complex signal input with the second coefficient signal correspondingly computed therefor;

second means for weighting each range cell sample of said delayed second complex signal input with the first coefficient signal correspondingly computed therefor;

first means for combining each range cell sample of said first complex signal input corresponding to a current IPP with said coherent weighted range cell sample of said delayed second complex signal input to form a first complex signal output of the lattice stage; and

second means for combining each range cell sample of said delayed second complex signal input corresponding to a current IPP with said coherent weighted range cell sample of said first complex signal input to form a second complex signal output of the lattice stage.

4,578,677

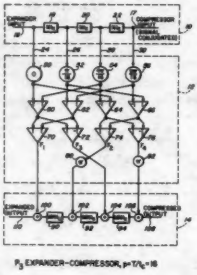
RANGE DOPPLER COUPLING MAGNIFIER

Bernard L. Lewis, Ft. Washington, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 23, 1983, Ser. No. 535,085

Int. Cl.[4] G01S *13/28*

U.S. Cl. 343—17.2 PC **11 Claims**



P_3 EXPANDER-COMPRESSOR, $p=T/t_c=16$

1. A pulse expander-compressor comprising:

an input signal expansion circuit responsive to an applied pulse for successively generating M replicas y(m) of the pulse with the time spacing between the end of one pulse replica and the beginning of the next pulse replica equal to a constant $(n-1)t_c$, where n is an integer n=2, 3, 4 . . . N, and t_c is the Nyquist sampling period for the bandwidth of the applied pulse;

a matched filter weighting circuit for receiving said M pulse replicas from said input-signal expansion circuit and weighting said pulse replicas y(m) with predetermined weights to effect the phase weights for a doppler tolerant polyphase code and providing M weighted output pulses; and

a time dispersion circuit including a plurality of adder means and first delay stages connected in series, said adder means alternating with said first delay stages, each of said adder means being connected to receive a different one of said M weighted output pulses from said weighting circuit, each of said first delay stages providing a delay which is Mnt_c; wherein said expander-compressor is clocked at the Nyquist rate for the bandwidth of said applied pulse.

4,578,678

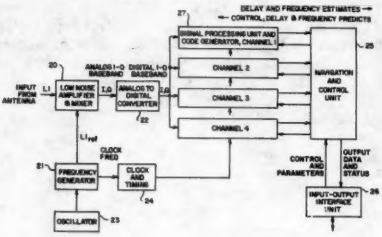
HIGH DYNAMIC GLOBAL POSITIONING SYSTEM RECEIVER

William J. Hurd, La Canada, Calif., assignor to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 14, 1983, Ser. No. 551,536

Int. Cl.[4] G01S *5/02*; H04B *7/185*

U.S. Cl. 343—357 **5 Claims**



1. In a receiver for a navigation system using a number of satellites which synchronously transmit pseudorange codes that are code division multiplexed on a carrier frequency, said receiver having means for amplifying the aggregate of the signals from said satellites, and converting said aggregate to baseband, means for demodulating said baseband to inphase and quadrature signals, means for converting said inphase and quadrature signals from analog to digital form, a separate signal processing channel for each satellite signal received, and navigation means responsive to pseudorange and frequency estimates from all of said channels for computing smoothed estimates of receiver position, velocity, clock offset and clock rate offset, a method for navigation tracking with said channels in parallel comprising the steps of

computing in each channel the maximum likelihood estimation of pseudorange, $\hat{\tau}$, to a satellite, and the frequency, $\hat{\omega}$, of the satellite at baseband during a measurement time,

computing smoothed estimates of receiver position, velocity, clock offset and clock rate offset from the maximum likelihood estimates $\hat{\tau}$ and $\hat{\omega}$, and data from said navigation means to predict pseudorange $\bar{\tau}$ and frequency $\bar{\omega}$ for the next measurement time for each satellite,

adjusting the digital baseband inphase and quadrature signals to a predicted frequency for the next measurement time in response to said smoothed estimate $\bar{\omega}$ of frequency, and

adjusting the phase of a code generator for generating a replica of the satellite pseudorange code with a predicted delay for the computation of the maximum likelihood estimate of pseudorange, $\hat{\tau}$, in the next measurement time in response to said smoothed estimate $\bar{\tau}$ of pseudorange.

4,578,679

METHOD AND APPARATUS FOR OBTAINING ANTENNA TRACKING SIGNALS

Günter Mörz, Ludwigsburg, Fed. Rep. of Germany, assignor to Ant Nachrichtentechnik GmbH, Backnang, Fed. Rep. of Germany

Filed May 5, 1983, Ser. No. 491,939

Claims priority, application Fed. Rep. of Germany, May 5, 1982, 3216708

Int. Cl.[4] G01S *5/02*

U.S. Cl. 343—427 **3 Claims**

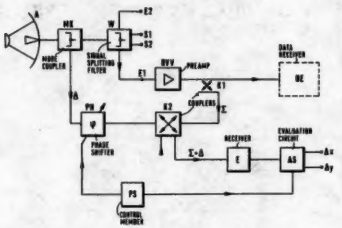
1. Apparatus for deriving control signals for positioning an antenna to track a signal source, said antenna having a boresight axis and sum and difference radiation patterns arranged about said axis, said sum and difference patterns having maximum and minimum amplitudes, respectively on said axis, comprising

first means for deriving at its output a sum signal corresponding to the sum radiation pattern of said antenna;

second means for deriving a single difference signal corresponding to the difference radiation pattern of said antenna;

controllable phase shifting means connected to said second means for receiving said difference signal and for selectively shifting the phase difference between said sum and difference signals by alternatively between one of 0° and 90°, a phase-shifted signal being produced at the output of said phase shifting means;

a 3-dB directional coupler having a first input port connected to the output of said first means, a second input port connected to the output of said phase shifting means,



a first output port providing a signal corresponding to the sum of the signals at said first and second input ports and a second output port providing a signal corresponding to the difference between the signals at said first and second input ports;

an evaluation current connected to the first and second outputs of said directional coupler and generating from the sum and difference signals thereof said antenna positioning control signals; and

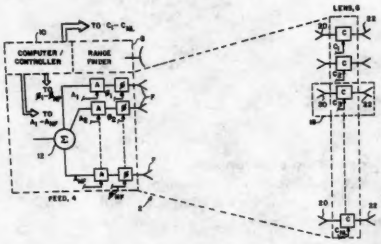
control means connected to said phase shifting means and between said coupler outputs and said evaluation circuit for alternatively connecting each output port of said coupler in turn to said evaluation current while causing said phase shifting means to shift the phase of the difference signal alternatively by 0° and 90°.

4,578,680

FEED DISPLACEMENT CORRECTION IN A SPACE FED LENS ANTENNA

Randy L. Haupt, Stow, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 2, 1984, Ser. No. 606,325
Int. Cl.⁴ H01Q *3/36*
U.S. Cl. 343—703 **7 Claims**



1. Apparatus for electronically correcting the far field pattern of a mechanically misaligned space fed lens antenna comprising:

a space fed lens antenna having a phased array feed and a phased array lens;

said phased array feed having a plurality of serially-connected phase shifters and feed elements;

said phased array lens having a plurality of serially-connected phase shifters and lens elements;

range finder means for determining the actual physical displacement of said phased array feed elements from said phased array lens elements and for providing range signals indicative thereof;

controller means for receiving said range signals and for providing first and second phase correction signals functionally related to said actual displacement and desired displacement of said feed elements from said lens elements;

means for applying said first phase correction signals to said phase shifters of said feed elements; and

means for applying said second phase correction signals to the phase shifters of said lens elements;

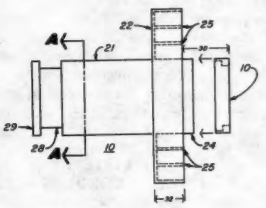
whereby the far field pattern of said space fed lens antenna is optimized.

4,578,681

METHOD AND APPARATUS FOR OPTIMIZING FEEDHORN PERFORMANCE

H. Taylor Howard, San Andreas, Calif., assignor to Chaparral Communications, Inc., San Jose, Calif.

Filed Jun. 21, 1983, Ser. No. 506,494
Int. Cl.⁴ H01Q *13/02, 13/06*
U.S. Cl. 343—786 **16 Claims**



1. Apparatus for optimizing performance of a feedhorn with a parabolic reflector in an antenna system, said feedhorn including a circular waveguide for receiving polarized signals at an aperture end, impedance matching means coupled to the other end and a corrugated plate disposed around the outside of the circular waveguide near the aperture end, said apparatus comprising an annular iris having an outside diameter approximately equal to the inside diameter of the circular waveguide for interference fit therewith, having an inside diameter determined by the desired beamwidth of the signal to be emitted therefrom, and having a longitudinal dimension selected to protrude beyond the corrugated plate of the feedhorn to approximately equalize the E and H plane beamwidths and selectively shape the signal patterns thereof.

4,578,682

ANTENNA DISH

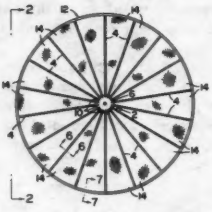
Robert L. Hooper, and Lawrence W. Yonge, III, both of Ocala, Fla., assignors to Raydx Satellite Systems, Ltd., Ocala, Fla.

Filed Mar. 20, 1984, Ser. No. 591,421
Int. Cl.⁴ H01Q *15/16*
U.S. Cl. 343—916 **11 Claims**

1. An antenna dish, such as may be used for reflecting and focusing electromagnetic signals such as television signals transmitted from satellites for reception and use, comprising

centrally disposed supporting means for supporting the components of the dish;

a plurality of elongated forming ribs, each comprising a tubular member that is bent prior to assembly of said dish to form a portion of generally parabolic curve, each said tubular rib having formed integrally therewith mesh receiving portions comprising at least one recess extending inwardly of said tubular member and generally parallel to said parabolic surface thereof for receiving a portion of metallic mesh therewithin, each said rib being attached at one end thereof to said centrally disposed supporting means and extending generally radially outwardly therefrom;



a plurality of foraminous metallic mesh members each formed of a mesh material reflective of said signal and extending between a pair of adjacent said forming ribs and received within said mesh receiving portions thereof and each extending radially outwardly continuously from a position adjacent said centrally disposed supporting means to a position adjacent the end of said ribs distal said supporting means; and

rim means connected to the end of said forming rib distal said supporting means, whereby the mesh members and ribs extending continuously outwardly from the centrally disposed supporting means form a generally parabolic dish structure for reflecting and focusing such signals.

4,578,683

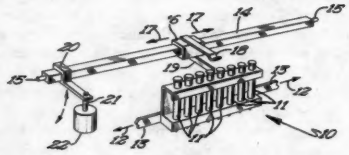
GRAPHIC RECORDING SYSTEM

James F. Gordon, Saratoga, Calif., assignor to Nicolet Instrument Corporation, Madison, Wis.

Continuation of Ser. No. 514,625, Jul. 18, 1983, abandoned. This application Oct. 28, 1985, Ser. No. 792,176

Int. Cl.[4] G01D *9/28, 15/24*

U.S. Cl. 346—49 **10 Claims**



1. In a graphic recording system of the type wherein a plurality of recording elements are carried by a carriage, the carriage being movable along a path relative to a recording medium, and having means for selectively actuating said recording elements, by mechanical engagement, for recording on said medium, the improvement wherein said actuating means comprises:

rod means having a longitudinal axis supported for rotation about said axis;

actuator means carried by said rod means independently of said carriage for rotation with said rod means into and out of engagement with said recording elements while being movable along said rod means; and

detent means selectively interlocking said actuator means and said carriage in predetermined relative positions for common movement of the actuator means and carriage only when the actuator means and carriage are interlocked.

4,578,684

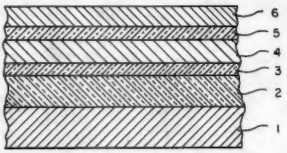
OPTICAL RECORDING AND INFORMATION ELEMENTS

Mool C. Gupta, W. Webster, and Douglas G. Stinson, Fairport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 28, 1985, Ser. No. 706,985

Int. Cl.[4] G01D *15/34;* **B32B** *27/00;* **G03C** *1/00*

U.S. Cl. 346—135.1 **8 Claims**



1. An optical recording element comprising a support bearing a metal reflective layer having thereover a heat-deformable recording layer characterized in that (a) a transparent ceramic layer is present between the support and the reflective layer and (b) a transparent ceramic layer having a thickness up to 0.05 μm is present between the reflective layer and the recording layer.

4,578,685

PEN CHANGEOVER MECHANISM FOR PEN RECORDER

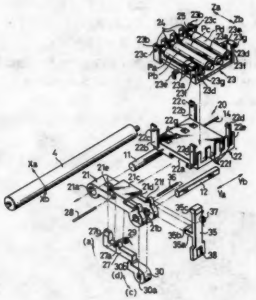
Hideto Tanaka, Tamayama, and Kyuichi Fu[illegible]awa, Tonan, both of Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Apr. 27, 1984, Ser. No. 604,723

Claims priority, application Japan, Apr. 27, 1983, 58-74756

Int. Cl.[4] G01D *15/16, 9/28*

U.S. Cl. 346—139 R **11 Claims**



1. A pen recorder comprising:

two bases adapted to be movable together in longitudinal directions parallel to a platen, one of said bases being driven by a driving means in said movement along said platen;

a plurality of pens mounted in parallel on one of said bases;

a hammer mounted on the other of said bases for pressing a selected pen toward said platen in a recording operation,

said hammer mounting base being selectively movable linearly relative to the pen mounting base so as to locate the hammer in a position corresponding to the selected pen;

pen changeover means including a lock mechanism interposed between said bases for locking said bases together when the hammer is located at the position corresponding to the selected pen for the recording operation; and

changeover driving means mounted to a frame of the pen recorder at a position remote from said bases, said locking mechanism being actuated by a driving cam slidably mounted on a driving shaft extending parallel to said platen and connected to said remote changeover driving means.

4,578,686

INK PRINTHEAD

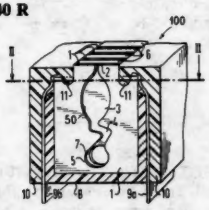
Emmeran Vollert, Grosshoehenrain, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 29, 1985, Ser. No. 696,206

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1984, 3403615

Int. Cl.[4] G01D *15/18*

U.S. Cl. 346—140 R **16 Claims**



1. In a writing head for an ink-printing device comprising piezo-electric drive elements which have a shape which changes due to suitable polarized drive pulses and under whose influence ink is sucked out of an ink reservoir through a common ink feed channel during an expansion phase and a small volume of ink is ejected in the form of a ink droplet during a following contraction phase, the improvements comprising each of the piezo-electric drive elements including at least one piezo-electric lamina with appropriate electrical connections, each of the laminae having a cut edge forming a recess with another edge to form an ink discharge opening in an upper region of the lamina, an ink chamber in a central expanded region, a choke channel in a constricted region separating an ink feeding opening in the lower region from the ink chamber; spacer elements having an opening therein, said spacer elements and laminae being arranged in a stack with a spacer element on each side of each laminae and the openings of the spacer elements being aligned with the ink feeding openings of the laminae to form an ink feed channel; and a common block receiving the stack of alternate laminae and spacer elements.

4,578,687

INK JET PRINTHEAD HAVING HYDRAULICALLY SEPARATED ORIFICES

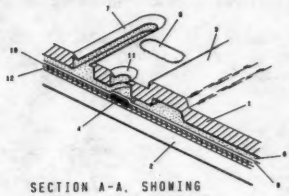
Frank L. Cloutier, Corvallis; Paul H. McClelland, Monmouth; William R. Boucher, Corvallis, and Gary L. Siewell, Albany, all of Oreg., assignors to Hewlett Packard Company, Palo Alto, Calif.

Filed Mar. 9, 1984, Ser. No. 588,016

Int. Cl.[4] G01D *15/18*

U.S. Cl. 346—140 R **6 Claims**

1. An improved ink jet printhead comprising an orifice plate affixed to a substrate member so as to permit the flow of a fluid between said orifice plate and said substrate member for selective ejection of said fluid from orifices in said orifice plate, said orifice plate containing a plurality of orifices and a plurality of elongated isolator slots adjacent thereto, said orifices and said isolator slots communicating with said fluid between said



orifice plate and said substrate member, said isolator slots having an active area six to ten times the area of said orifices.

4,578,688

LIGHT BEAM PRINTER

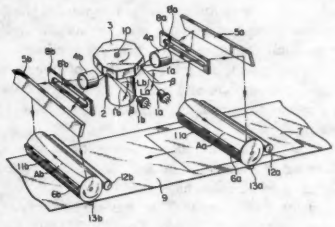
Takuo Okuno, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 9, 1984, Ser. No. 598,269

Claims priority, application Japan, Apr. 12, 1983, 58-63029

Int. Cl.[4] G01D *15/121*

U.S. Cl. 346—157 **6 Claims**



1. A light beam printer including:

means for forming a first light beam modulated corresponding to a frist image informatin signal;

means for forming a second light beam modulated corresponding to a second image information signal;

a first movable photosensitive medium exposed to said first light beam to form a first color image;

a second movable photosensitive medium exposed to said second light beam to form a second color image;

a first rotatable polygonal mirror for scanning said first light beam, said first polygonal mirror being rotated about an axis inclined with respect to said first light beam entering said first polygonal mirror so that said first light beam depicts a first curved movement locus on said first photosensitive medium;

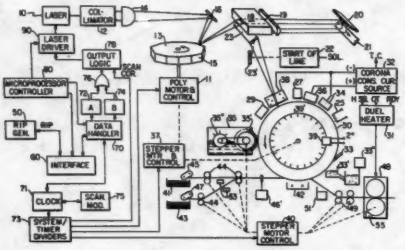
a second rotatable polygonal mirror for scanning said second light beam, said second polygonal mirror being rotated about an axis inclined with respect to said second light beam entering said second polygonal mirror by such an angle that said second light beam depicts on said first photosensitive medium a second movement locus curved in the same direction and by the substantially same amount as the first movement locus; and

means for transferring said first color image and said second color image onto the same transfer medium in superposed relationship with each other.

4,578,689
DUAL MODE LASER PRINTER

David R. Spencer, Melville, and Amnon Goldstein, Pelham, both of N.Y., assignors to Data Recording Systems, Inc., Melville, N.Y.

Filed Nov. 26, 1984, Ser. No. 674,620
Int. Cl.[4] G01D 15/14
U.S. Cl. 346—160 5 Claims



1. A laser printer system having at least two operating modes, said modes differing from each other in terms of resolution and speed such that the higher the resolution the lower the speed, comprising:

a photosensitive medium;

means for generating a modulated beam of laser light focused onto said medium;

at least one moving mirror surface located in the path of said focused light beam before said medium for reflecting the beam such that it sweeps across the medium;

detector means for detecting the start of sweep of the beam across the medium and producing a start of line signal;

clock means for producing a plurality of related clock signals;

photosensitive medium motor means for moving said photosensitive medium at a rate determined by a first one of said plurality of clock signals; and

control means for controlling the modulation of said laser beam according to a second one of said plurality of clock signals and the start of line signal, said control means causing the printer to operate in at least (1) a high resolution mode wherein the light beam is modulated at a high rate determined by the second clock signal during fewer than every scan by the moving mirror surface and the first clock signal causes the medium to move at a slow speed, and (2) a low resolution mode wherein the light beam is modulated at a lower rate by the second clock signal during a greater number of scans by the moving mirror surface than the higher resolution mode and the first clock signal causes the medium to move at a faster speed.

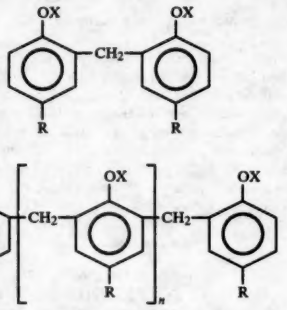
4,578,690
CARBONLESS DEVELOPER SHEET

Norman T. Veillette, Hollis, and Robert J. Malik, Hudson, both of N.H., assignors to Nashua Corporation, Nashua, N.H.

Filed Aug. 13, 1984, Ser. No. 639,739
Int. Cl.[4] B41M 5/16, 5/22
U.S. Cl. 346—212 5 Claims

1. A sheet of record material sensitized with a CF coating to produce a color on contact with oil-soluble, basic chromogenic, acid colorable dyes, said coating characterized in that it includes:

A. a phenolic resin material consisting of one or a mixture of



where X is independently hydrogen or zinc, R is independently an alkyl group having 1–8 carbon atoms, an aryl group, or a hydrogen atom, and n equals 1–8;

B. Benzoic acid; and

C. an inorganic magnesium compound which is Mg(OH) 2, MgO, or a mixture thereof,

wherein components A, B, and C are present in about the following ratio in parts by weight:

A. 50

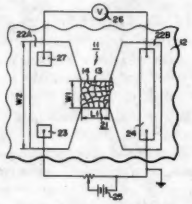
B. 0.5–4.0

C. 4–40.

4,578,691
PHOTODETECTING DEVICE

Toshiaki Murakami; Yoichi Enomoto, both of Mito, and Minoru Suzuki, Katsuta, all of Japan, assignors to Nippon Telephone & Telegraph Public Corporation, Tokyo, Japan

Filed Sep. 14, 1984, Ser. No. 651,069
Claims priority, application Japan, Sep. 20, 1983, 58-173668
Int. Cl.[4] H01L 39/22
U.S. Cl. 357—5 5 Claims



1. A photodetecting device having Josephson junctions, comprising:

an insulating substrate;

a polycrystalline superconductor film of $BaPb_{1-x}Bi_xO_3$ (where $0.05 \leqq x < 0.32$) having an I-V characteristic of weak link type under temperature condition less than transition temperature of said $BaPb_{1-x}Bi_xO_3$, formed on said insulating substrate such that Josephson junctions are formed at grain boundaries, said superconductor film having a first region subjected to light illumination, and second and third regions formed contiguously at both sides of said first region such that a width of each of said second and third regions is wider than that of said first region;

means for supplying a predetermined bias current between said second and third regions; and

means for detecting a change in voltage between said second and third regions, one terminal of said means for supplying

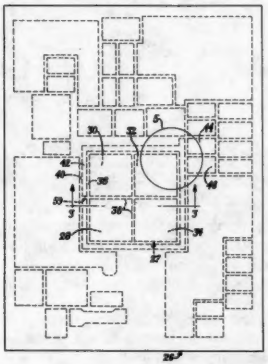
and one terminal of said means for detecting being commonly grounded.

4,578,692

INTEGRATED CIRCUIT WITH STRESS ISOLATED HALL ELEMENT

Jacob K. Higgs, Concord, N.H., and John Humenick, Shrewsbury, Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed Apr. 16, 1984, Ser. No. 600,875
Int. Cl.⁴ H01L *27/22, 27/04*
U.S. Cl. 357—27 **10 Claims**



1. A silicon integrated circuit chip comprising a semiconductor substrate of one conductivity type, an epitaxial layer of the opposite conductivity type on one face of said substrate, a Hall element disposed in a central portion of the outer surface of said epitaxial layer, an amplifier circuit including a plurality of bipolar transistor, another portion of said epitaxial layer surrounding said Hall element containing a network of opposite-conductivity-type isolation walls forming a plurality of PN junction isolated pockets of one conductivity type, said transistors occupying at least some of said pockets, said Hall element being separated from the adjacent of said pockets by a moat surrounding said Hall element, said moat being comprised of two concentric spaced apart heavily doped isolation walls of said one conductivity type, said concentric isolation walls each having at least one downward diffused portion from said surface, the span of said moat at said surface being greater than three times the thickness of said epitaxial layer to isolate said Hall element from built-in stresses in said surrounding epitaxial layer portion adjacent to said Hall element.

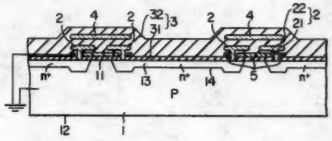
4,578,693

SEMICONDUCTIVE PHOTODETECTOR DEVICE

Yoshiaki Yazawa, Hitachi; Nobuaki Miyakawa, Ibaraki; Toji Mukai, Hitachi; Takahide Ikeda, Tokorozawa, and Tatsuya Kamei, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 17, 1983, Ser. No. 505,447
Claims priority, application Japan, Jun. 18, 1982, 57-104009
Int. Cl.⁴ H01L *27/14, 31/00*
U.S. Cl. 357—30 **25 Claims**

1. A semiconductive photodetector device comprising:
a semiconductor substrate of one conductivity type having a pair of major surfaces;
a plurality of semiconductor regions of the other conductivity type which are juxtaposed and contiguous to one major surface of said semiconductor substrate, said one major surface serving as a light receiving surface, said semiconductor substrate and semiconductor regions forming pn junctions therebetween having edges terminated at said one major surface;
an insulating film overlying said one major surface of said semiconductor substrate;
a plurality of electrodes disposed inside said insulating film and having each a leg portion which extends in a direction perpendicular to said one major surface and which has one end in ohmic contact to an associated semiconductor region and a flat portion which is contiguous to the other end of said leg portion and which extends in a direction substantially parallel to said one major surface so as to optically shield an edge of the pn junction of the associated semiconductor region



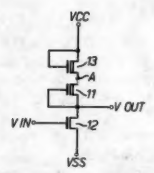
and which extends above a portion of said semiconductor substrate lying between edges of adjacent pn junctions; and
a polysilicon film interposed between said flat portion of said electrode inside the insulating film and said one major surface of said semiconductor substrate, extending above said edge of the pn junction and a peripheral portion of said associated semiconductor region, and electrically connected to said semiconductor substrate, said polysilicon film optically shielding edges of adjacent pn junctions and the portion of said semiconductor substrate lying between edges of adjacent pn junctions and forming a capacitance with said associated semiconductor region.

4,578,694

INVERTER CIRCUIT PROVIDED WITH GATE PROTECTION

Shoji Ariizumi, and Makoto Segawa, both of Tokyo, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 30, 1982, Ser. No. 429,183
Claims priority, application Japan, Oct. 20, 1981, 56-167556
Int. Cl.⁴ H01L *27/04, 29/78;* **H03K** *17/08, 17/687*
U.S. Cl. 357—41 **2 Claims**

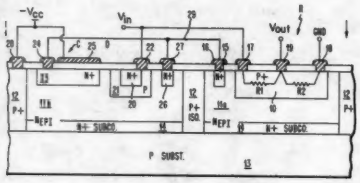


1. An integrated circuit comprising:
a first enhancement type MOSFET having a gate coupled to an input signal;
a second depletion type MOSFET having a gate and a source connected to a drain of the first MOSFET; and
a third depletion type MOSFET having a gate and a drain connected directly to a power supply and a source connected to a drain of the second MOSFET;
said third MOSFET acting as a voltage divider in conjunction with said second MOSFET to decrease noise applied from said power supply through said third MOSFET to said second MOSFET;
wherein an output signal corresponding to the input signal is derived from the drain of the first MOSFET.

4,578,695
MONOLITHIC AUTOBIASED RESISTOR STRUCTURE AND APPLICATION THEREOF TO INTERFACE CIRCUITS

Francois-Xavier Delaporte, Cagnes; Gerard M. Lebesnerais, Perthes, and Jean-Pierre Pantani, Nice, all of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 21, 1983, Ser. No. 554,025
Claims priority, application European Pat. Off., Nov. 26, 1982, 82430037.0
Int. Cl.[4] H01L *27/04;* H02H *9/04;* H03K *3/01, 5/153*
U.S. Cl. 357—48 4 Claims



1. In an integrated circuit an autobiased resistor structure (FIG. 1) fabricated on a P type semiconductor substrate (13) comprising:

an N type epitaxial layer (11*a*, 11*b*) on said substrate;

a P type isolation wall (12) extending through said epitaxial layer to said substrate, said isolation wall forming first and second isolated N type epitaxial pockets (11*a*, 11*b*) on said substrate;

first and second spaced apart N+ type regions (23, 26) contained in said first N type epitaxial pocket;

a first P type region (21) contained in said first N type epitaxial pocket, said first P type region positioned between and spaced from said first and second N+ type regions contained in said first N type epitaxial pocket;

a N+ type pocket (20) contained in said first P type region contained in said first N type epitaxial pocket;

a third N+ type region (15) contained in said second N type epitaxial pocket;

a first P+ type region (10) contained in second N type epitaxial pocket;

an electrode (25), said electrode spaced from and coextensive with at least a portion of said first N+ type region contained in said first N type epitaxial pocket;

a first connection means (28) electrically connecting said P+ type isolation wall (12), said P substrate (13) and said electrode (25) to a source of potential V_{CC};

second connection means (29) electrically connecting in common said first and second spaced apart N+ type regions (23, 26) contained in said first N type epitaxial pocket and said third N+ type region (15) in said second N type epitaxial pocket;

first, second and third spaced apart contacts (17, 18, 19), said first, second and third spaced apart contacts, in the order recited, electrically contacting said first P+ region (10) contained in said N type epitaxial pocket;

third connection means electrically connecting in common said N+ type pocket (20) contained in said first P type region (21), said first P type region (21) contained in said first N type epitaxial pocket, said first contact (17) and a source of potential V_{in};

fourth connection means connecting said third contact (18) to a source of potential V_{GND};

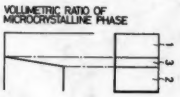
fifth connection means connecting said second contact (19) to an output terminal V_{out} for providing an output voltage V_{out}; and,

said first P+ region is a voltage divider resistor (R1 + R2) having first, second and third taps provided by said first, second and third contacts (17, 18, 19), and said resistor is electrically isolated from said substrate by diode/capacitor circuit means.

4,578,696
THIN FILM SEMICONDUCTOR DEVICE

Masakazu Ueno, and Takeshige Ichimura, both of Kanagawa, Japan, assignors to Director-General of Agency of Industrial Science and Technology, Tokyo, Japan

Filed Nov. 23, 1983, Ser. No. 554,656
Claims priority, application Japan, Nov. 25, 1982, 57-205536
Int. Cl.[4] H01L *29/04, 31/06*
U.S. Cl. 357—59 3 Claims



1. A thin film semiconductor device comprising:

an amorphous semiconductor layer having a microcrystalline phase;

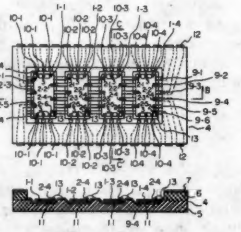
an amorphous semiconductor layer having no microcrystalline phase; and

at least one junction region between said above two layers, said junction region comprising a layer in which the microcrystalline phase content gradually increases in the thickness direction of said amorphous semiconductor layer having said microcrystalline phase.

4,578,697
SEMICONDUCTOR DEVICE ENCAPSULATING A MULTI-CHIP ARRAY

Yoshihiro Takemae, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 15, 1982, Ser. No. 388,616
Claims priority, application Japan, Jun. 15, 1981, 56-091799
Int. Cl.[4] H01L *23/16*
U.S. Cl. 357—75 9 Claims



1. A semiconductor device comprising:

(a) a plurality of semiconductor chips, each chip having perpendicular X- and Y-axes, circuit elements, common connection pads arranged along the peripheral portions of the X-axis, and individual connection pads arranged along the peripheral portions of the Y-axis;

(b) a package having perpendicular X- and Y-axes, said plurality of semiconductor chips being arranged in series along the Y-axis of the package; and

(c) a conductive layer formed on said package, said conductive layer having

(i) common conductive strips commonly used for said

plurality of semiconductive chips and extending along said Y-axis of said package to said plurality of semiconductor chips, and

(ii) individual conductive strips corresponding to each of said semiconductor chips and arranged laterally of said common conductive strips,

wherein each of said common connection pads is electrically connected to one of said common conductive strips and each of said individual connection pads is electrically connected to one of said individual conductive strips.

4,578,698

MULTIPLE DISPLAY CONTROL APPARATUS FOR A TELEVISION RECEIVER

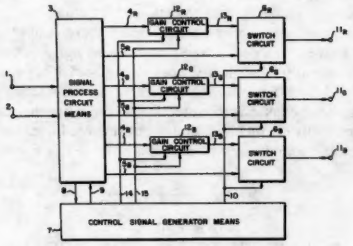
Yutaka Miki, Hirakata; Toshiro Nozoe, Yamatokoriyama, and Kiyoshi Uchimura, Uji, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jun. 16, 1983, Ser. No. 504,783

Claims priority, application Japan, Jun. 18, 1982, 57-105905; Jun. 18, 1982, 57-105907; Jun. 18, 1982, 57-105908

Int. Cl.⁴ H04N *5/268*

U.S. Cl. 358—22 **8 Claims**



1. A multiple display control apparatus for a television receiver, comprising:

a signal process circuit having a first television signal input terminal and a second television signal input terminal;

a control signal generator means connected to said signal process circuit; and

a gain control circuit and a switching circuit, said gain control circuit being connected with a first signal output of said signal process circuit and second and third control signal outputs of said control signal generator means, said switching circuits being connected with said gain control circuit, a second signal output of said signal process circuit, and a switch signal output of said control signal generator means, and said signal process circuit being connected with a first control signal output of said control signal generator means, so that the gain control characteristics of said control circuit depends on an output impedance of said signal process circuit and resistances, and control starting voltage of said gain control circuit is made equal to or higher than the pedestal level of the television signal, wherein said apparatus is arranged so that the level of said first signal output of said signal process circuit is lowered in response to said second and third control signal output of said control signal generator means.

4,578,699

COLOR CAMERA WITH STRIPE FILTER USING CONTROLLED BIAS LIGHT FOR DARK SCENE NOISE IMPROVEMENT

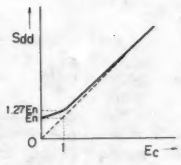
Itsuo Takanashi, Yokohama; Shintaro Nakagaki, Fujisawa; Kenichi Miyazaki, Yokohama, and Takashi Kuriyama, Tokyo, all of Japan, assignors to Victor Company of Japan, Limited, Kanagawa, Japan

Filed Nov. 28, 1983, Ser. No. 555,863

Claims priority, application Japan, Nov. 26, 1982, 57-207265

Int. Cl.⁴ H04N *9/07, 9/04*

U.S. Cl. 358—44 **7 Claims**



1. A color television imaging apparatus with improved color reproducibility in a dark area of a scene deteriorated due to noise, said imaging apparatus comprising:

a color television imaging device for generating a composite color television video signal, said device including a photoelectric transducer section and a color separation stripe filter;

at least two demodulators for individually producing color signal components by demodulating carrier color signals each of which is derived from an output signal of the imaging device;

bias light supply means for applying bias light to the photoelectric transducer section of the imaging device through the color separation stripe filter; and

bias light control means for maintaining the carrier color signals to be demodulated at a value which is greater than the peak-to-peak value of noise which is contained in the color signals by controlling said bias light supply means.

4,578,700

APPARATUS FOR STORING DATA RELATING TO TELEVISION VIEWING

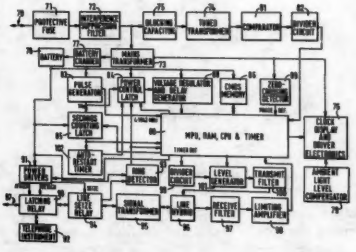
Lyn M. Roberts; Robert L. Shrier, both of London, and Raymond Laxton, Maidenhead, all of United Kingdom, assignors to AGB Research PLC, London, England

Filed May 24, 1984, Ser. No. 614,322

Claims priority, application United Kingdom, May 25, 1983, 8314468

Int. Cl.⁴ H04H *9/00*

U.S. Cl. 358—84 **6 Claims**



1. An arrangement for storing data received from a TV monitoring system and for transmitting the data to a remote

computer by means of a telephone line, the arrangement comprising:

a memory for storing the data;

means for measuring successive periods of time;

means for defining a plurality of data access time slots in each of the successive periods of time;

a telephone instrument coupled to the telephone line;

a first switch for selectively isolating the telephone instrument from the telephone line during the data access slots;

means for detecting an incoming call during a data access slot and for seizing the line;

a second switch for selectively isolating the detection means from the telephone line outside of the data access slots;

means for ascertaining whether the incoming call is from the remote computer;

means responsive to the ascertaining means for causing the data to be transmitted from the memory to the remote computer when the incoming call is ascertained as being from the remote computer;

means for dropping the line and then actuating the first switch to reconnect the telephone instrument to the telephone line for the remainder of the current data access slot, when the ascertaining means ascertains that the incoming call is not from the remote computer;

means for actuating the second switch to connect the detecting means to the telephone line for the next available data access slot; and

means for controlling the second switch actuating means to inhibit connection of the detection means to the telephone line during the data access slots of a period which follows successful transmission of the data to the remote computer in an access slot of the period.

4,578,701

METHOD OF RECORDING AN OPTIONAL NUMBER OF COLOR SEPARATION IMAGES IN AN OPTIONAL ORDER AND IN OPTIONAL POSITIONS ON A RECORDING MEDIUM

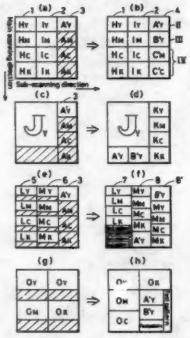
Etsuo Nakaji, Shiga, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Aug. 1, 1983, Ser. No. 518,837

Claims priority, application Japan, Nov. 1, 1982, 57-192897

Int. Cl.[4] H04N *1/46*

U.S. Cl. 358—78 **21 Claims**



1. A method of recording color separation images in an image reproducing system which records a plurality of color separation images from scanning of a color original picture comprising the step of recording each of an optional number of color separation images on a film in an optional order and in optional positions during one scanning cycle of recording according to section pulses which divide one scanning cycle into a plurality of time sections.

4,578,702

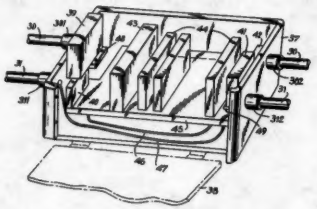
CATV TAP-OFF UNIT WITH DETACHABLE DIRECTIONAL COUPLER

Wallace S. Campbell, III, Littleton, Colo., assignor to American Television & Communications Corporation, Englewood, Calif.

Filed May 31, 1984, Ser. No. 615,814

Int. Cl.[4] H04N *7/10*; H03H *7/48*

U.S. Cl. 358—86 **3 Claims**



1. A signal transmission device for use in a cable television system, said device connected in series between a first CATV feeder cable portion and a second CATV feeder cable portion, said device comprising:

a main housing having an input terminal for attachment to the CATV feeder cable portion and an output terminal for attachment to the second CATV feeder cable portion;

a connecting cable attached to the output terminal of said main housing for supplying signals received at the input terminal of said main housing to the output terminal of said main housing;

a chassis detachably mounted in said housing, said chassis having electronic circuitry mounted thereon; and

an at least partially detachable directional signal coupler for directionally electrically connecting said electronic circuitry, said input terminal, and said connecting cable when said chassis is mounted in said main housing, and for electrically connecting said input terminal and said connecting cable when said chassis is removed from said main housing.

4,578,703

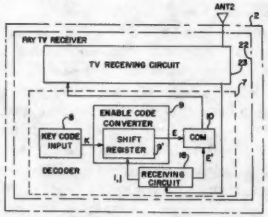
SUBSCRIPTION TELEVISION SYSTEM

Tsutomu Kanai, Saitama, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 290,384, Aug. 5, 1981. This application Dec. 12, 1983, Ser. No. 560,908

Int. Cl.[4] H04N *7/173*

U.S. Cl. 358—117 **1 Claim**



1. A subscription television system including a transmitting system for transmitting ciphered video signals, enable codes each having a plurality of bits, and control signals, said system further including a receiving system having a plurality of subscription television receivers each having a decoder, wherein said decoder comprises:

a receiving means for receiving the enable code and the control signals from said transmitting system;

a key code input means for setting a key code having a plurality of key code bits, said key code input means having a plurality of digital switches to input said key code by means of said digital switches;

a converting means for converting said key code from said key code input means into enable codes in response to control signals from said receiving means;

a comparator means for comparing an enable code from said converting means with the enable code from said receiving means, so as to determine if both codes are consistent or not, and for producing a signal to render said television receiver operative to receive said ciphered video signals when said both codes are consistent, said key code input means comprising:

a first multiplexer circuit for receiving bit signals sent by said digital switches;

an identification code generating circuit;

a second multiplexer circuit for receiving identification codes from said identification code generating circuit;

a scanner actuating said first and second multiplexer circuits to sequential sensings of said bit signals from said digital switches and said identification codes from said identification code generating circuit, so as to provide at the output of each of said multiplexer circuits a converted serial signal representation of the individual bit codes provided to said multiplexers;

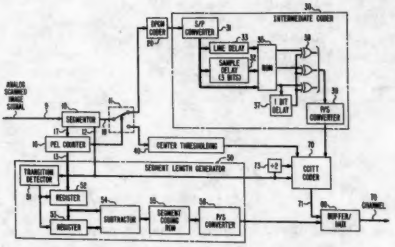
a half adding circuit for adding the serial data read out from said first and second multiplexer circuit; and

converting means including a shift register for obtaining said enable code from said key code by circulating the key code bits with the key code bit corresponding to the control signal and progressively picking up each bit therein.

4,578,704
IMAGE CODING TECHNIQUE

Hamid Gharavi, Middletown, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 20, 1983, Ser. No. 505,885
Int. Cl.⁴ H04N *7/12, 1/40, 1/417, 1/419*
U.S. Cl. 358—135 **28 Claims**



1. Apparatus comprising,

means for receiving a stream of values associated with respective pels of an image,

means for generating a stream of codewords in response to said stream of values, said means for generating including means for generating a codeword for each pel as a function of the frequency with which the value associated with that pel is expected to occur, given the values associated with predetermined ones of its neighbors,

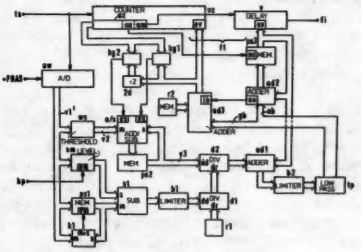
the codeword generated for at least ones of the pels whose associated value is the most frequently expected to occur, given the values associated with its said neighbors, being a first binary word all of whose bits have a first predetermined value, and

the codeword generated for at least ones of the pels whose associated value is the second most frequently expected to occur, given the values associated with its said neighbors, being a second binary word a selected one of whose first and last bits has a second predetermined value and the others of whose bits have said first value.

4,578,703
DIGITAL CIRCUIT FOR SYNCHRONIZING A PULSE TRAIN

Herbert Elmis, Denzlingen, and Reiner Backes, Freiburg, both of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Mar. 23, 1984, Ser. No. 592,920
Claims priority, application European Pat. Off., Mar. 26, 1983, 83710013.0; Aug. 9, 1983, 83201165.4
Int. Cl.⁴ H04N *5/04, 5/12;* **H03L** *7/00*
U.S. Cl. 358—148 **16 Claims**



1. A digital circuit for generating a pulse train and synchronizing said pulse train with horizontal synchronizing pulses contained in a demodulated composite color signal, comprising:

a source of clock signals having a frequency at least one order of magnitude higher than the frequency of said pulse train;

a presettable counter, having a preset input, a count input coupled to said source of clock signals, a predetermined count output, and a count output for a count occurring before said predetermined count output;

an analog-to-digital converter clocked by said clock signals for converting said demodulated composite color signal to digital signals;

a threshold stage coupled to the output of said analog-to-digital converter and having a threshold value equal to a predetermined black level;

a black level measuring stage coupled to the output of said analog-to-digital converter and having an enable input for receiving a keying pulse in each line during a color burst;

a comparator having a first input coupled to the output of said analog-to-digital converter, a second input and an output for indicating when said first input is greater than said second input;

a first buffer memory having an input coupled to the output of said analog-to-digital converter, an output coupled to said comparator second input, and an enable input coupled to said comparator output;

a subtracter having a minuend input coupled to said first buffer memory output, and a subtrahend input coupled to the output of said black level measuring stage, and an output;

a first limiter having an input coupled to said subtracter output, and an output, said limiter limiting its output to a positive numerical value near zero;

a first divider having a dividend input coupled to said first limiter output, a divisor input and an output;

a second buffer memory having an input and an output;
an adder/subtracter having a first input coupled to the output of said threshold stage, a second input coupled to said second buffer memory output, an output coupled to said second buffer memory input and add and subtract control inputs;
a second divider having a dividend input coupled to said second buffer memory output, a divisor input coupled to said first divider output, and an output;
a first adder having a first input coupled to said second divider output, a second input and an output;
a second limiter coupled to said first adder output, and having an output, said second limiter limiting its output to a numerical value of a phase error required for a predetermined capture range of synchronization;
a low pass filter coupled to said second limiter output and having an output comprising p lower order bits and m-p higher order bits;
a second adder having a first input coupled to said p lower order bits of the output of said low pass filter, a second input, an overflow output and an output;
a third buffer memory having an input coupled to said second adder output, an output coupled to said second adder second input and said first adder second input, and an enable input coupled to said presettable counter count output;
a digitally settable delay circuit comprising 2^P stages, each stage providing an equal delay time said delay circuit providing a delay between input and output terminals which is adjustable in equal size steps, each step being equal to said equal delay time and to the period of said clock signals divided by 2^P, said delay circuit input being coupled to said predetermined count output of said presettable counter, said delay circuit output providing said synchronized pulse train said delay circuit having control inputs for determining said delay, said control inputs being coupled to said third buffer memory output;
a third adder having a first input coupled to said second adder overflow output, a second input coupled to said low pass filter m-p higher order bits, a third input receiving the integral part of a predetermined divisor value and
an output coupled to said presettable counter preset input;
circuit means having first inputs coupled to outputs of said presettable counter and second inputs coupled to said third adder output for deriving switching signals at a first output coupled to said adder/subtracter add control input and at a second output coupled to said adder/subtracter control input; and wherein
said first divider divisor input receives the numerical value 2^P.

4,578,706

TELEVISION SYNCHRONOUS RECEIVER

Yoichi Sakamoto, Takatsuki, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

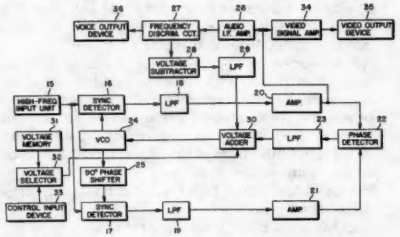
Filed Nov. 9, 1983, Ser. No. 550,217

Claims priority, application Japan, Nov. 12, 1982, 57-199185; Dec. 1, 1982, 57-211717

Int. Cl.[4] H04N *5/50;* **H04B** *11/32*

U.S. Cl. 358—195.1 **4 Claims**

1. A television synchronous receiver comprising:
a voltage-controlled oscillator; a 90° phase shifter which shifts by 90° the phase of an output of said voltage-controlled oscillator; first and second synchronous detectors which detect an in-phase component and quadrature component of a video carrier signal which is output from an input unit of said receiver by two synchronous carriers comprising an output of said voltage-controlled oscillator and an output of said 90° phase shifter; a phase detector which is operatively connected to said first and second synchronous detectors and which detects a phase difference between the said video carrier signal and the output of said voltage-controlled oscillator; a first low-pass filter for low-pass filtering the output of said phase detector; a frequency discriminator which discriminates the frequency of an audio intermediate frequency signal generated by said first synchronous detector; and a second low-pass filter which low-pass filters an output of said



frequency discriminator, wherein the output of said second low-pass filter together with the output of said first low-pass filter which low-pass filters the output of said phase detector are adapted to be fed back to said voltage-controlled oscillator.

4,578,707

METHOD OF REDUCING VERTICAL SMEARS OF A SOLID STATE IMAGE SENSOR

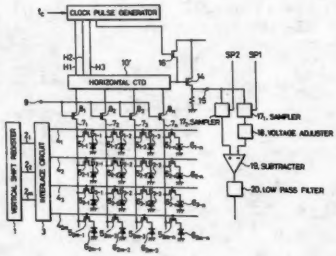
Naoki Ozawa, Kokubunji; Toshiyuki Akiyama, Kodaira; Shusaku Nagahara, Hachiouji; Shinya Ohba, Tukui; Haruhisa Ando, Nishitama, and Toshifumi Ozaki, Hachiouji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 18, 1984, Ser. No. 662,133

Claims priority, application Japan, Oct. 18, 1983, 58-194685; Oct. 18, 1983, 58-194686

Int. Cl.[4] H04N *3/12*

U.S. Cl. 358—212 **18 Claims**



1. A method of reducing the vertical smears generated in a solid state image sensor which comprises:
a plurality of photoelectric conversion elements arrayed regularly in horizontal and vertical directions;
a plurality of vertical signal lines for transferring charges in a vertical direction;
horizontal transfer means including at least one charge transfer device, for transferring charges in a horizontal direction;
a first group of switches for respectively transferring the signal charges, which are generated in the respective ones of said photoelectric conversion elements in response to an incident ray, to predetermined ones of said vertical signal lines; and
a second group of switches for transferring said signal charges from said vertical signal lines to said horizontal transfer means,
wherein for a horizontal blanking period, the signal charges

of said photoelectric conversion elements existing on one horizontal line are transferred through said first group of switches, said vertical signal lines and said second group of switches to said horizontal transfer means; and, for a tracing period succeeding said horizontal blanking period, said signal charges are transferred by said horizontal transfer means to the output terminal thereof to obtain a signal corresponding to one horizontal scanning line,

said method comprising the steps of:

transferring the smear charges stored on said vertical signal lines to said horizontal transfer means;

transferring said signal charges from said photoelectric conversion elements to said vertical signal lines and further from said vertical signal lines to said horizontal transfer means;

transferring said smear charges and said signal charges separately of each other to the output terminal of said horizontal transfer means by said horizontal transfer means;

obtaining a smear voltage corresponding to said smear charges and a signal voltage corresponding to said signal charges at the output terminal of said horizontal transfer means;

adjusting the magnitude of said smear voltage at a predetermined ratio in accordance with the ratio of the storage period of the smear charge component mixed in said signal charges to the storage period of said smear charges; and

subtracting said adjusted smear voltage from said signal voltage to reduce the smear component contained in said signal voltage.

4,578,708

CAMERA SUPPORT ASSEMBLY

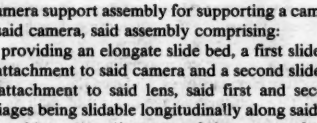
Derek Munnion, Andover, England, assignor to Link Electronics Limited, England

Filed Sep. 9, 1983, Ser. No. 531,210

Claims priority, application United Kingdom, Sep. 9, 1982, 8225700

Int. Cl.[4] H04N *5/225*

U.S. Cl. 358—229 **5 Claims**



1. A camera support assembly for supporting a camera and a lens for said camera, said assembly comprising:

a base providing an elongate slide bed, a first slide carriage for attachment to said camera and a second slide carriage for attachment to said lens, said first and second slide carriages being slidable longitudinally along said slide bed to provide ready adjustment of the center of gravity of said camera and said lens with respect to said base and to mitigate bending loads between said camera and said lens;

an optical unit, said optical unit being connected to said lens; and

suspension means for suspending said camera and said lens to maintain said camera in operative engagement with said lens, said suspension means comprising a resilient suspension unit for resiliently suspending said camera in operative engagement with said lens to provide for small displacements of said lens relative to said camera.

4,578,709

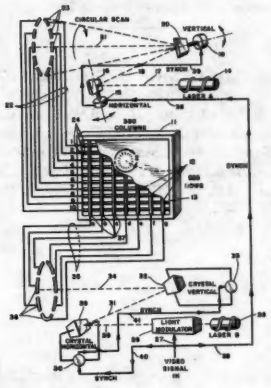
FLAT OPTICAL TV SCREEN

Paul W. Lang, and Franklin C. Gribshaw, both of Long Beach, Calif., assignors to Allen Jensen and Goldstake, a part interest to each

Filed Aug. 3, 1984, Ser. No. 637,273

Int. Cl.[4] H04N *3/08*

U.S. Cl. 358—230 **10 Claims**



4. A flat TV screen for optically displaying images defined by a TV signal, including:

(a) overlapping rows and columns of mediums, each emitting light laterally from its path when energized such that a cross-over point will emit more light than radiates from the side of a single medium when both of the crossing mediums are energized:

(b) means for sequentially passing light of a constant brightness into each of said rows;

(c) means responsive to said TV signal to modulate light in brightness in accord with the video portion of said TV signal; and

(d) means for successively passing the modulated light into all of said columns during the time period that each row is energized to thereby provide an optical reproduction of the TV signal from a dot matrix of light defined at the crossover points of the rows and columns.

4,578,710

LENS SYSTEM FOR PROJECTION TELEVISION

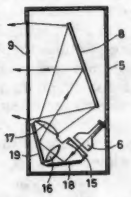
Shinichi Hasegawa, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed May 7, 1984, Ser. No. 607,915

Claims priority, application Japan, May 9, 1983, 58-67846[U]

Int. Cl.[4] H04N *5/74, 9/31*; G02B *17/00*

U.S. Cl. 358—231 **6 Claims**



1. In a projection television receiver including a cabinet, a

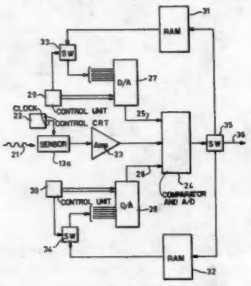
projecting cathode-ray tube, a display screen and a projecting lens system for projecting an image formed on a face of said cathode-ray tube onto said screen, the improvement wherein said lens system comprises a plano-convex lens and a plano-concave lens having optical axes forming an angle within a range of 170° to 180°, first and second mirrors for reflecting light rays passing through said plano-concave lens along a path parallel to said optical axis of said plano-convex lens, and a convex lens disposed in an optical path between said plano-concave lens and said plano-convex lens.

4,578,711

VIDEO DATA SIGNAL DIGITIZATION AND CORRECTION SYSTEM

James M. White, Charlotte; Ronald W. May, Matthews, both of N.C., and Michael D. Gulliver, Rockford, Mich., assignors to International Business Machines (IBM), Armonk, N.Y.

Filed Dec. 28, 1983, Ser. No. 566,365
Int. Cl.⁴ H04N *1/40, 1/04, 1/10*
U.S. Cl. 358—282 **5 Claims**



1. An analog video data signal digitization and correction system comprising

scanning means including a plurality of sensing devices for scanning a medium to produce video data signals representative of images printed on said medium,

reference quantity generating means for generating for each sensing device two reference quantities representative respectively of the reference signals produced by said sensing device when scanning two reference types of image and for utilizing said reference quantities to establish for said video data signals a range of possible values between maximum and minimum values defined by said reference quantities,

and means for comparing said video data signals with said range of possible values to generate for each analog video data signal a corrected digital value based on the position of said video data signal in said range,

said reference quantity generating means including means for generating two analog reference signals, means for generating for each analog reference signal a digital reference signal having N bits representative of the position of said analog signal in a range of possible values, the accuracy of said digital reference signal being dependent upon the value of N and the length of the range selected, and means for storing said digital signals and for converting said digital signals into analog reference quantities,

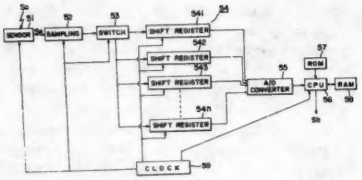
characterized in that said digital reference signal generating means includes means for selecting and utilizing only a portion of the possible range of values in order to establish a relatively high accuracy for the digital reference signal with a relatively low value of N, and in that said means for converting said digital reference signal into said analog reference quantity includes means for combining and converting extra high order bits into said N bit signal so that the accuracy of said analog reference quantity is substantially equal to the accuracy of said digital reference signal.

4,578,712

PICTURE IMAGE DISCRIMINATING APPARATUS

Masahiko Matsunawa, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Dec. 13, 1982, Ser. No. 449,385
Claims priority, application Japan, Dec. 19, 1981, 205520; Dec. 25, 1981, 56-212471; Dec. 25, 1981, 56-212472; Dec. 25, 1981, 56-212473; Dec. 28, 1981, 56-213828; Dec. 28, 1981, 56-213830
Int. Cl.⁴ H04N *1/40*
U.S. Cl. 358—282 **12 Claims**



1. A picture image discriminating apparatus comprising means for scanning a picture image of a document, means for converting photoelectrically a light signal corresponding to a density of the picture image obtained by the scanning means into a picture image signal, means for reading the picture image signal at every unit and reading sizes of 0.01 square mm or over, and means for discriminating the picture image by using the picture image signal read, wherein the density signal of the picture image of the document is processed to obtain an effective density histogram, and a cumulative value of the density signals over or below a specific density threshold is obtained in said histogram, thereby discriminating the picture image.

4,578,713

MULTIPLE MODE BINARY IMAGE PROCESSING

Sherman H. Tsao, Plano, and Wayne P. Sharum, Austin, both of Tex., assignors to The Mead Corporation, Dayton, Ohio

Filed Jul. 20, 1984, Ser. No. 633,120
Int. Cl.⁴ H04N *1/40*
U.S. Cl. 358—283 **9 Claims**
MICROFICHE APPENDIX INCLUDED
(2 Microfiche, 45 Pages)

1. A method of processing image data comprising gray scale values individually representative of small picture elements of a document to be printed or displayed on a bilevel printer or display device, said method comprising the steps of:

(a) partitioning said image data into data blocks each comprising an x by y matrix of contiguous image data;

(b) determining the average input density of each of said data blocks;

(c) assigning a number corresponding to how many of the total picture elements of each of said data blocks are to be printed based on the average density of each data block;

(d) distributing the number of picture elements to be printed within each data block by applying the following substeps:

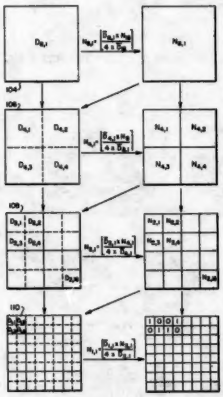
(1) subpartitioning each data block into subblocks each comprising a fractional portion of the image data of the subpartitioned block;

(2) dividing the number of picture elements to be printed for each subpartitioned block among the subblocks based on the ratios of the average densities of the subblocks to the average density of the subpartitioned block;

(3) subpartitioning each subblock into new subblocks each

comprising a fractional portion of the image data of the subpartitioned subblock;

(4) dividing the number of picture elements to be printed for each subpartitioned subblock among the newly formed subblocks based on the ratios of the average



densities of the newly formed subblocks to the average density of the subpartitioned subblock; and

(5) repeatedly performing substeps (3) and (4) for all subblocks until each picture element to be printed has been assigned to a specific picture element of said document.

4,578,714

HALFTONE IMAGE RECORDING APPARATUS

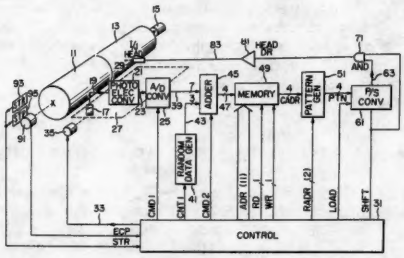
Susumu Sugiura, Yamato, and Takashi Sugino, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 360,685, Mar. 22, 1984, abandoned. This application Dec. 10, 1984, Ser. No. 680,229

Claims priority, application Japan, Mar. 30, 1981, 56-45589

Int. Cl.[4] H04N *1/40*

U.S. Cl. 358—283 **21 Claims**



1. A halftone image recording apparatus comprising:

signal generating means for generating an m-bit density signal representing a density of an image;

level signal generating means for generating a level signal;

converting means for forming a resultant signal using said m-bit density signal and said level signal and for converting the resultant signal into an n-bit density signal, where n is less than m; and

recording means for recording an image to be reproduced in response to said n-bit density signal, said recording means including image pattern selecting means for selecting an image pattern in correspondence with said n-bit signal.

4,578,715

PICTURE SIGNAL QUANTIZING CIRCUIT

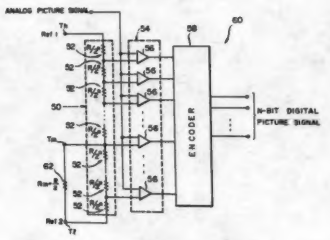
Shingo Yamaguchi, Atsugi, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Feb. 13, 1984, Ser. No. 579,329

Claims priority, application Japan, Feb. 14, 1983, 58-22574; Feb. 14, 1983, 58-22575

Int. Cl.[4] H04N *1/40*

U.S. Cl. 358—283 **8 Claims**



5. A picture signal quantizing circuit for quantizing with respect to multiple levels an analog picture signal representative of a picture which is read from a document, comprising:

a background level detector for detecting and holding a peak value of the analog picture signal to generate a background level voltage indicative of a background level of the document;

a reference voltage generator for dividing the detected and held background level voltage to determine a highest level and a lowest level for quantization to generate a first reference voltage and a second reference voltage corresponding to the highest level and the lowest level respectively;

a reference voltage divider comprising a series circuit having 2^n ladder resistors connected serially to generate different output voltages from junctions between said resistors, a first tap led out from one end of said series circuit, a second tap led out from the other end of the series circuit, and a third tap led out from a predetermined position between said first and second taps;

halftone reproducibility accentuating means for, when quantizing an analog picture signal by comparing the signal with a reference voltage, non-linearly dividing the reference voltage so that a halftone portion of the analog picture signal, and thereby a halftone of a reproduced picture are accentuated;

a comparator circuit comprising (2^n-1) comparators for respectively comparing the output voltages from the junctions between the resistors of the series connection with the analog picture signal; and

an encoder for generating a digital signal in response to outputs of said comparators, said digital signal being an n-bit binary code;

the halftone reproducibility accentuating means comprising a first resistor having a predetermined resistance and connected between the second and third taps;

the halftone reproducibility accentuating means further comprising a first switch connected in series to the first resistor, a second resistor connected to the first tap, a second switch connected in parallel to the second resistor, a third resistor connected between the second tap and ground, and a third switch connected in parallel to the third resistor.

4,578,716

METHOD OF AND APPARATUS FOR MAKING A TEST STRIP AND A TEST STRIP MADE BY SUCH METHOD

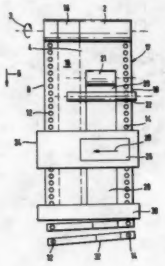
Rainer van Rijckevorsel; Joachim Kasielke, both of Brühl; Heinz Macho, Mannheim; Peter Schäfer, Ludwigshafen, and Klaus Nenninger, Mannheim, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Jul. 16, 1984, Ser. No. 630,899

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1983, 3326689

Int. Cl.[4] G11B 5/00

U.S. Cl. 360—1 32 Claims



1. A method of making a test strip with a longitudinally extending carrier and a test field, comprising:

disposing a band of test field material on a broader band of carrier material substantially parallel to two longitudinal edges thereof;

providing said band of said carrier material with a first row of substantially equidistant recesses in the region of one of said two longitudinal edges and with a second row of substantially equidistant recesses in the region of the other of said two longitudinal edges;

applying onto said band of said carrier material a layer of magnetizable material;

recording by means of a recording head an amount of data for the storage of information in said layer of magnetizable material transversely to the production direction, said carrier band being positioned and aligned by means of said first and second recesses during that recording step; and

dividing up said band of said carrier material transversely to said production direction into a plurality of longitudinally extending test strips in such a manner that said recesses are close to the ends of each strip.

4,578,717

MAGNETIC RECORD CARD TRANSDUCING APPARATUS AND METHOD

Jerome H. Lemelson, 48 Parkside Dr., Princeton, N.J. 08540

Continuation-in-part of Ser. No. 379,517, May 18, 1982, which is a continuation-in-part of Ser. No. 158,286, Jun. 10, 1980. This application Aug. 6, 1982, Ser. No. 405,996

Int. Cl.[4] G11B 5/004, 5/80

U.S. Cl. 360—2 20 Claims

1. Magnetic transducing apparatus for transducing information with respect to flexible magnetic record cards comprising in combination:

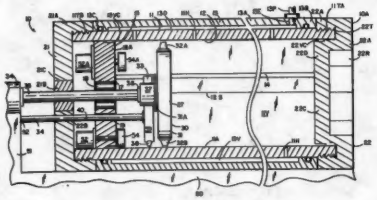
first means for supporting a flexible magnetic record card in an arcuate formation defining a portion of a cylinder with the inside surface of the arcuately formed card containing magnetic recording material,

transducing means operable for magnetically transducing information with respect to selected of a plurality of parallel record tracks provided in the magnetic recording material of a flexible record card supported by said first means while said flexible record card is deformed into the shape of a partial cylinder and the parallel record tracks thereof form respective parallel interrupted circular track formations extending around the inside of said arcuate formation of said flexible record card,

a support for supporting said transducing means within said arcuate formation of said record card and adjacent to but out of operable relation with respect to said record card supported by said first means,

second means for effecting controlled powered rotary movement between said transducing means and said first means,

third means for effecting powered lineal movement between said transducing means and said first means to bring said transducing means and a selected circularly extending track of an arcuately deformed card supported by said first means into scanning alignment so as to permit said transducing means to transduce information with respect to a selected track of said card,



fourth means for effecting controlled relative movement in a radial direction between said transducing means and a cylindrically configured record card supported by said first means to cause said transducing means to be projected outwardly into operable relation with said selected track of said record card so as to permit said transducing means to transduce information with respect to said selected track of said card,

fifth means for energizing said transducing means when operatively located with respect to said selected track of said card as said second means effects said controlled powered rotary movement between said transducing means and said first means, and

sixth means for effecting controlled relative radial movement between said transducing means and said first means to cause said transducing means to be inwardly retracted from its operable relation with respect to said card when a transducing operation has been completed.

4,578,718

CONTROL ARRANGEMENT AND METHOD FOR VIDEO TAPE RECORDER

Robert R. Parker, Wheeling, and Dev R. Rattan, Chicago, both of Ill., assignors to Bell & Howell Company, Skokie, Ill.

Filed Jun. 16, 1983, Ser. No. 504,914

Int. Cl.[4] H04N 5/782

U.S. Cl. 360—10.3 9 Claims

1. Control apparatus for controlling the operation of a video or cassette recorder in response to control signals from a microcomputer, the video recorder having first and second audio channel signals on two respective audio signal paths and a video signal on a video signal path, the control apparatus comprising:

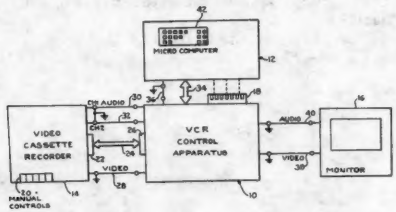
means for generating digital control signals responsive to the control signals from the microcomputer;

control signal means responsive to digital control signals for generating audio and video selection signals;

audio switching means responsive to said audio selection signals for selectively providing an audio monitor output of one of the first audio channel signal, the second audio

channel signal and no audio in accordance with said digital control signals; and

video switching means responsive to said video selection signals for selectively providing a video monitor output of one of the video recorder video signal and a computer



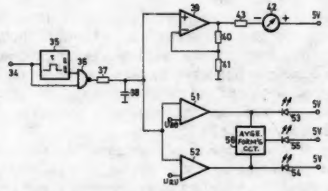
generated video signal on a second video path in accordance with said digital control signals independently of said audio switching means and said audio signal selection, said digital control signals including at least data representations defining three audio selection states and two video selection states independent of said audio selection states.

4,578,719

TRACKING ERROR RECOGNITION IN REPRODUCED DIGITAL SIGNALS

Jürgen Heitmann, Alsbach-Hähnlein; Rolf Loos, Eppertshausen, both of Fed. Rep. of Germany, and Peter Wagner, Newark, N.J., assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 6, 1984, Ser. No. 679,035
Int. Cl.[4] G11B *27/36, 21/10*
U.S. Cl. 360—31 **3 Claims**



1. Method of recognizing tracking error in reproduction of digitally coded television signals recorded on a magnetic tape, comprising:

detecting the presence of multiple errors in any data block of said reproduced television signals supplied block by block to a check-word-operated error detection unit which provides an output signal in response to each detection of multiple errors in a data block;

prolonging the duration of each of said output signals;

detecting the overlap of a said output signal before prolongation with the prolongation of a previous output signal of said error detection unit to provide and overlap signal;

integrating successions of overlap signals over a constant integration time dimension to provide an integrated output signal, and

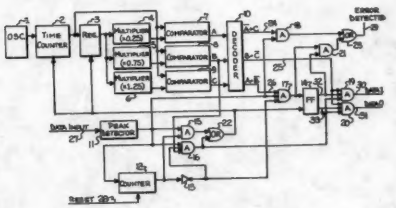
comparing said integrated output signal with at least one predetermined voltage level for producing a tracking error signal.

4,578,720

SELF-CLOCKING CODE DEMODULATOR WITH ERROR DETECTING CAPABILITY

Takeshi Matsumoto, Kanagawa, Japan, assignor to International Business Machines Corp. (IBM), Armonk, N.Y.

Filed Aug. 1, 1983, Ser. No. 518,897
Claims priority, application Japan, Aug. 6, 1982, 57-136400
Int. Cl.[4] G11B *5/02*
U.S. Cl. 360—51 **5 Claims**



1. A demodulator for extracting data from a stream of binary signals that may be of varying frequency, said stream of binary signals comprising clock signals and data signals between said clock signals and including means for receiving said stream of signals, means for detecting individual one of said signals and means for generating output data signals in response to the data signal content of said stream of signals, and wherein the improvement comprises:

means for individually measuring the time duration between each set of successive clock signals, the time duration between each set of clock signals dynamically changing as a function of the frequency of the stream of binary signals,

means responsive to each of said measured time durations for dynamically establishing a predetermined time interval during which succeeding valid data or clock signals can be anticipated, the time duration of each of the predetermined time intervals changing as a function of the time duration between each pair of successive clock signals,

means responsive to the detection of a signal during a time other than said predetermined established time interval for generating an error output signal, and

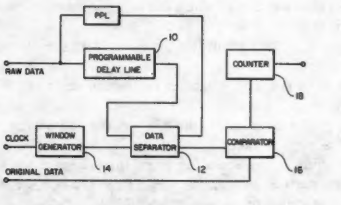
means responsive to the detection of more than one signal within said predetermined established time interval during which a single valid data signal can be anticipated for generating an error output signal.

4,578,721

STRESS TEST FOR MAGNETIC DISC RECORDING APPARATUS

William L. Brannan, Jr., Felton, Calif., assignor to Seagate Technology, Scotts Valley, Calif.

Filed Sep. 10, 1984, Ser. No. 648,470
Int. Cl.[4] G11B *5/09*
U.S. Cl. 360—51 **5 Claims**



1. Apparatus for evaluating recording systems including means coupled to said head for reading data from one of said tracks, means for generating a succession of data windows having leading and trailing edges, a data separator connected

to receive said data windows and the read data and serving to separate out data which falls outside the windows, and means for delaying said data from each track on the disc relative to at least one edge of said data windows to provide a more limited effective size window at said separator for testing the effective separation of the data, said delaying means including means for delaying the data until errors are encountered to define a failure point, and for reducing the data delay to a time just less than the failure point.

4,578,722

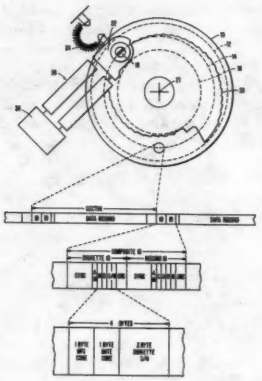
METHOD FOR CHECKING DISK IDENTITY IN A FLEXIBLE DISK RECORDER

Jeffrey L. Lovgren, Rochester, Minn., and William B. Plummer, Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1982, Ser. No. 452,548

Int. Cl.⁴ G11B *5/02, 5/09*

U.S. Cl. 360—60 **7 Claims**



1. Method for checking the identity of a recording disk which may be interchangeably loaded with other recording disks into a disk recording device, said method comprising the steps of:

reading a disk identifier from any data sector on the recording disk;

storing the disk identifier read from the recording disk;

accessing a track on the recording disk in preparation for performing an operation on the recording disk at the accessed track;

reading a disk identifier from the accessed track;

comparing the identifier read from the accessed track to the identifier previously stored;

proceeding with the operation on the recording disk if the identifier just read is the same as the stored identifier;

aborting the operation on the recording disk if the identifier just read is not the same as the stored identifier.

4,578,723

HEAD POSITIONING SYSTEM WITH AUTOMATIC GAIN CONTROL

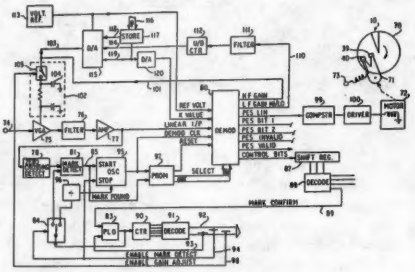
Alan J. Betts, Romsey, and Peter J. Elliott, Alresford, both of United Kingdom, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 15, 1983, Ser. No. 504,552

Claims priority, application European Pat. Off., Jun. 18, 1982, 82303179.4

Int. Cl.⁴ G11B *21/10, 5/02*

U.S. Cl. 360—77 **10 Claims**



1. A head positioning system with automatic gain control, for use with disk surfaces, comprising:

a head positioning actuator for moving at least one transducing head transversely of concentric information storage tracks on one of the disk surfaces;

position reference information on one of the disk surfaces for defining the radial position of the information storage tracks, the position reference information having a circumferentially extending and radially repeated pattern including at least two radially offset subsets of servo elements, the servo elements in each subset being circumferentially and radially aligned and arranged such that certain of the boundaries between radially adjacent circumferential rows of elements are aligned with the information storage track centres;

a transducing head, movable by the actuator, for detecting the position reference information and for producing, for each of the subsets of servo elements passing beneath the head, a corresponding servo signal whose peaks are generally representative of the radial position of the head;

a variable gain amplifier for amplifying the servo signals from the transducing head;

means responsive to the amplified servo signals from the variable gain amplifier for generating, for each amplified servo signal corresponding to a respective subset of servo elements, a position error signal which is a linear function of radial position of the head over a portion of the radial width of a row of servo elements, the different position error signals corresponding to the respective subsets of servo elements being phase related;

means for generating, from the different phase position error signals, a composite position error signal, the composite position error signal being comprised of selected linear portions of each of the different phase position error signals;

feedback means for feeding back the composite position error signal to control the head positioning actuator;

means for generating a gain function for the variable gain amplifier, the gain function generating means including means for selecting from the different phase position error signals certain of those phase position error signals which are generally within their linear range and for combining said selected phase position error signals to form a portion of the gain function; and

and a gain control feedback for controlling the gain of the

variable gain amplifier in dependence on the gain function.

4,578,724

TAPE CASSETTE HOLDER WITH RELEASABLE REEL HOLD-DOWN

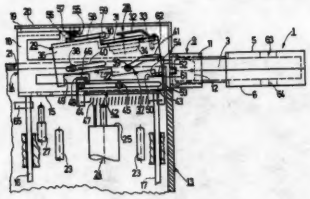
Franz Beitler, Vienna, Austria, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 22, 1982, Ser. No. 443,511

Claims priority, application Austria, Jun. 11, 1982, 2281/82

Int. Cl.[4] G11B *15/66, 23/04*

U.S. Cl. 360—85 **18 Claims**



1. A tape cassette recording and/or reproducing apparatus for use with a cassette having two mutually parallel major cassette walls, at least one rotatable reel hub disposed within the cassette and axially accessible through openings in each of said walls, and a length of tape arranged within the cassette for winding on said reel hub, said apparatus comprising

a cassette holder movable between a loading position which defines a cassette insertion path, arranged such that a cassette having its major walls aligned parallel to the path can be inserted into the holder along said path, and an operating position in which an inserted cassette occupies an operating position,

a rotatable winding mandrel arranged to engage said reel hub of a cassette, which has been inserted and is in the operating position, through one of the major walls of said cassette, the other of said major walls being remote from the winding mandrel,

a carrying member disposed on the cassette holder and having a portion extending substantially parallel to the major walls of an inserted cassette, and

reel-hub hold-down means arranged on said carrying member adjacent said other major wall for cooperating with said reel hub through said other major wall to hold the reel hub in a predetermined position relative to the winding mandrel when the cassette is in the operating position,

characterized in that said carrying member and portion are arranged on the cassette holder to be movable, at least transversely of the major walls of an inserted cassette, between a rest position in which said means is disposed outside the insertion path, and an operating position in which said means engages the reel hub,

the cassette holder comprises at least one actuating member movably mounted thereon and projecting into the insertion path, and means for movably mounting the actuating member to the cassette holder arranged such that, during movement of a cassette being inserted along the insertion path, the cassette engages and moves the actuating member in an insertion direction,

the apparatus comprises means for moving the carrying member from its rest position to its operating position in response to movement of said actuating member in said insertion direction,

the apparatus further comprises a return spring having an end, and means for connecting said end to said actuating member for exerting a biasing force against said actuating member opposing movement in said insertion direction, and

said reel-hub hold-down means is arranged on the carrying member so as to be adjacent said reel hub of a cassette being inserted when the cassette engages the actuating member.

4,578,725

VCR WITH IMPROVED FAST WINDING STATIC ELECTRICITY DRAIN

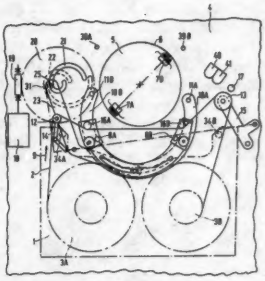
Johannes C. A. Muller, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 4, 1983, Ser. No. 481,707

Claims priority, application Netherlands, Apr. 15, 1982, 8201573

Int. Cl.[4] G11B *15/66*

U.S. Cl. 360—85 **12 Claims**



1. A magnetic-tape deck for cassettes containing a magnetic tape wound on and transported between two reels, comprising:

a chassis,

a circular cylindrical drum having a circumferential surface defining a drum axis,

at least one magnetic head mounted to said drum and movable in a circular path about said axis,

a playing-loop device for withdrawing a length of magnetic tape from a cassette placed on the deck, to form a playing loop when the deck is in a "play" mode of operation, said playing loop having a central part and two ends, said ends being at the respective reels within the cassette, the central part of the loop wrapped around a part of said drum for cooperation with said at least one magnetic head; said playing-loop device comprising first and second playing-loop-guide supports having respective first and second playing-looped guides mounted thereon; and said supports being movable between an inoperative position in which the respective guides are disposed in the cassette, and an operative position in which the playing-loop guides are in guide positions respectively upstream and downstream of the drum for guiding the playing loop,

fast-winding means for winding said magnetic tape between the reels in the cassette during a "fast forward" or "fast reverse" mode of operation, said means comprising a fast-winding-loop device for withdrawing a length of magnetic tape from the cassette and subsequently guiding it to form a fast-winding loop outside the cassette; said fast-winding-loop device comprising a fast-winding-loop guide support to which a fast-winding-loop guide is fixed, said fast-winding-loop guide support being movable with respect to said chassis between an inward position, in which the fast-winding-loop guide is disposed inside the cassette behind the magnetic tape, and a fast-winding position, in which the fast-winding-loop guide is disposed outside the cassette; and said fast-winding means further comprising means for moving the fast-winding-loop guide support between said inward and fast-winding positions, and

at least one draining element formed of an electrically conductive material, so arranged that during a fast-winding

mode of operation said at least one draining element contacts that surface of the length of magnetic tape which contacts the drum during operation in the play mode, for draining static electricity from said surface of the magnetic tape,

characterized in that said draining element is arranged on one of said playing-loop-guide supports such that the magnetic tape passes between said playing-loop-guide and said draining element, when the playing-loop-guide support is in the inoperative position said draining element and the respective playing-loop-guide being substantially opposite each other with respect to the magnetic tape.

4,578,726

HEAD ARM MOUNTING DEVICE FOR ONE OR MORE SCANNING HEADS IN RECORDING PLAYBACK APPARATUS FOR DISK RECORDS

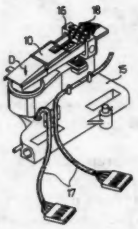
Udo Boehm; Ernst-Juergen Grittmann, both of Ludwigshafen, and Klaus Schulze-Berge, Mutterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 11, 1983, Ser. No. 465,761

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1982, 3205947; Oct. 11, 1982, 8228522[U]

Int. Cl.[4] G11B *5/016, 5/55, 21/08*

U.S. Cl. 360—99 **11 Claims**



1. In an apparatus for recording on, and/or playing back from, recording media, especially a flexible recording disks, of the type having a carriage, a head arm which carries a magnetic scanning head, and a suspension system for pivotally mounting said head arm on said carriage including a loading spring for pivotally biasing said head arm, said suspension system comprising

a U-shaped mount formed on said carriage, said U-shaped mount having upstanding legs which straddle said head arm and which terminate at respective free ends

a pivot shaft about which said head arm is mounted for pivoting movement, said shaft having respective ends supported by said legs at intermediate points on said legs, and

tension spring means integrally formed with the U-shaped mount to span between the free ends of said legs for resiliently urging said legs toward the ends of said shaft so as to eliminate axial plat of said shaft in the operation of said apparatus.

4,578,727

DEVICE FOR STABILIZING THE MOVEMENT OF A FLOPPY DISK OVER A MAGNETIC HEAD

Robert G. C. Hills, Spencerport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 27, 1984, Ser. No. 583,558

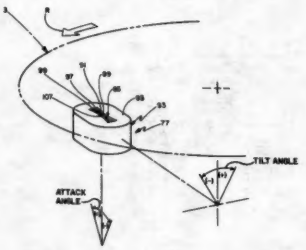
Int. Cl.[4] G11B *17/32, 5/016*

U.S. Cl. 360—102 **8 Claims**

1. A contacting type head-to-disk stabilizing unit for use in disk drive apparatus that rotates a flexible storage disk, said unit comprising:

a record and/or playback head having transducer means for coacting with a rotated disk to record or playback information on the disk; and

a stabilizer block including (i) means defining a cavity containing said head and (ii) a flat air bearing surface which is long in proportion to width generally in a direction tangential to the direction of rotation of the disk, though is substantially smaller than the disk and disposed completely about said transducer means in substantially coplanar relation with said transducer means to permit said flat surface to penetrate with said transducer means into the nominal plane of the disk for stabilizing successive portions of the disk before each portion is located to coact with said transducer means;



said defining means (i) forming an opening to said cavity at said air bearing surface which is long in proportion to width generally in the same direction said surface is long in proportion to width and (ii) extending completely about the sides of said head in suitably spaced relation to effect a negative pressure chamber in said cavity for inducing pull down of successive portions of the disk into contact with said transducer means as each portion is located over said opening.

4,578,728

MAGNETIC HEAD

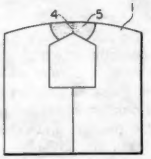
Hiroshi Sakakima; Mitsuo Satomi; Yukihiro Yanagiuchi, all of Osaka, and Harufumi Senno, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 30, 1982, Ser. No. 445,721

Claims priority, application Japan, Dec. 9, 1981, 56-196909; Dec. 29, 1981, 56-212873

Int. Cl.[4] G11B *5/127*

U.S. Cl. 360—125 **8 Claims**



1. A magnetic head which slideably contacts a magnetic recording medium, said head comprising a core including a substrate having high resistance to wear, a thin amorphous alloy film formed on a major surface of the substrate and forming at least part of a magnetic path, and a magnetic gap provided at a portion of said thin amorphous alloy film which is adjacent to the magnetic recording medium, wherein the thin amorphous alloy film has a composition of $Co_aM_bT_c$ wherein $70 \leqq a \leqq 95$, $0 \leqq b \leqq 20$, $5 \leqq c \leqq 20$ and $a+b+c=100$, where M is at least one metal selected from the group consist-

ing of Fe, Ni, Cr, Mo, W and Mn, and T is at least one metal selected from the group consisting of Ti, Zr, Hf, Nb and Ta.

4,578,729

MAGNETIC RECORDING MEDIUM

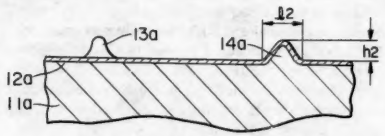
Takashi Suzuki, Osaka; Hiroshi Fujimori, Nara, and Masaru Odagiri, Hyogo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 15, 1982, Ser. No. 434,600

Claims priority, application Japan, Oct. 15, 1981, 56-16519; Dec. 9, 1981, 56-199282

Int. Cl.[4] G11B *5/70*

U.S. Cl. 360—134 **4 Claims**



1. A magnetic recording medium comprising

a thin ferromagnetic metal film formed as a magnetic layer; and strip protrusions having a height between 100 and 2,000 A distributed over the surface of said magnetic layer at an average density ranging from 10^4 to 10^6 protrusions per mm^2, and the ratio between the length and the height of said protrusions is less than 10:1.

4,578,730

HIGH-VOLTAGE DC CIRCUIT BREAKER APPARATUS

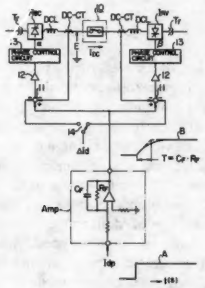
Shunji Tokuyama, Hitachi; Kooji Suzuki, Takahagi; Kunio Hirasawa, Hitachi; Yoshio Yoshioka, Hitachi, and Keiji Arimatsu, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 12, 1983, Ser. No. 541,245

Claims priority, application Japan, Oct. 13, 1982, 57-178351

Int. Cl.[4] H02H *3/00*

U.S. Cl. 361—4 **4 Claims**



1. A high-voltage DC circuit breaker apparatus with reverse current insertion system by line voltage charge comprising a commutation switch, a series circuit of a capacitor, a reactor and a switch connected in parallel with said commutation switch, a resistor for charging said capacitor, the charging time constant of said capacitor determined by the capacity of said capacitor and said resistor being used as a reference in a manner so that the rise time constant of the line voltage is smaller than the charging time constant of said capacitor, and the rise time constant of the line current is larger than the charging time constant of said capacitor, a first DC current transformer connected to one side of said commutation switch, a first DC reactor connected to said forst DC current transformer, a rectifier connected to said first DC reactor, a second DC current transformer connected to another side of said commutation switch, a second DC reactor connected to said second DC current transformer, an inverter connected to said second DC reactor, an operational amplifier for receiving a predetermined current and for outputting the predetermined current with a time lag, a current margin change-over switch for providing a current margin, a first comparator for comparing an output of said operatonal amplifier with said current margin and an output of said first DC current transformer, a first amplifier for amplifying an output of said first comparator, a first phase control circuit connected between said first amplifier and said rectifier, a second comparator for comparing the output of said operational amplifier with the current margin and output of said second DC current transformer, a second amplifier for amplifying an output of said second comparator, and a second phase control circuit connected between said second amplifier and said inverter.

4,578,731

DEVICE FOR SUPPLYING AN ELECTRIC RECEIVER WHOSE POSITION ON A SURFACE IS VARIABLE

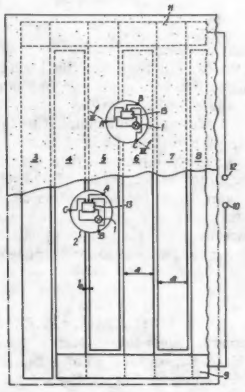
Johannes Andriessen, Verrey-sous-Salmaise, and Daniel Gaillard, Mirebeau-sur-Beze, both of France, assignors to Assistance Maintenance Construction Electrique, Verry-sous-Salmaise, France

Filed Mar. 20, 1984, Ser. No. 591,495

Claims priority, application European Pat. Off., Feb. 3, 1984, 84400243.6

Int. Cl.[4] H02H *3/16*

U.S. Cl. 361—42 **19 Claims**



1. A device for supplying electric current to an electric receiver comprising:

(a) a network of electric conducting strips covered with insulating material, including:

(1) a first assembly of strips adapted to be operatively connected to one pole of a source of electrical current; and

(2) a second assembly of strips adapted to be operatively connected to another pole of said source of electrical current;

(b) a movable current pick-up having at least three current sensors capable of coming into electrical contact with said strips; and

(c) a circuit, having a plurality of inputs operatively connected respectively to said at least three sensors and an output operatively connected to the receiver, for supplying the receiver when at least one of said at least three sensors comes into contact with one conducting strip in

said first and second assemblies and at least another of said at least three sensors comes into contact with a second conducting strip in the other of said first and second assemblies, said at least three sensors being of substantially equal length and being adapted to pass through said insulating material.

4,578,732

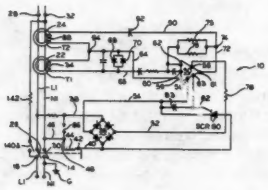
GROUND FAULT CIRCUIT INTERRUPTER INCLUDING SNAP-ACTING CONTACTS

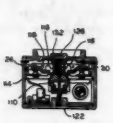
Charles W. Draper, Palm Harbor, Fla., and Terry E. Franks, Leicester, N.C., assignors to Square D Company, Palatine, Ill.

Filed Dec. 14, 1983, Ser. No. 561,608

Int. Cl.[4] H02H *3/28;* H01H *83/02*

U.S. Cl. 361—45 **13 Claims**





1. A protective device adapted to be connected in a power distribution system with the system having a neutral conductor and at least one line conductor carrying current between an A.C. source and a load comprising:

ground fault sensing means coupled to the conductors for monitoring current in the conductors and producing an output signal when the total current in the line conductors is not equal to the current in the neutral conductor;

an over center toggle for interrupting circuits including the conductors; and,

means responsive to said output signal for operating said over center toggle so as to interrupt said circuits.

4,578,733

SURGE VOLTAGE ARRESTER

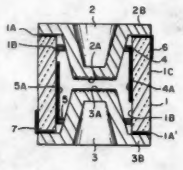
Daizo Shigemori, Sagamihara; Haruo Kunii, Isehara, and Masaaki Endo, Sagamihara, all of Japan, assignors to Kabushiki Kaisha Sankosha, Tokyo, Japan

Filed May 2, 1984, Ser. No. 606,123

Claims priority, application Japan, Jun. 25, 1983, 58-98099[U]

Int. Cl.[4] H02H *9/06*

U.S. Cl. 361—120 **12 Claims**



1. A surge voltage arrester comprising:

a hollow cylindrical body prepared from insulating material;

a pair of main electrodes which are fitted in a gastight fashion to both open ends of said hollow cylilndrical body to jointly define a closed chamber in such a manner that the discharge planes of said paired main electrodes are set opposite to each other at a prescribed interval in said hollow cylindrical body;

at least one electrically conductive member which extends along the inner wall of said hollow cylindrical body in its circumferential direction in such a manner that said electrically conductive member faces one of said main electrodes at a prescribed interval;

at least one electrically conductive strip which is electrically connected to said electrically conductive member and which extends along the inner wall of said hollow cylindrical body in its axial direction in such a manner that said electrically conductive strip faces the other main electrode at a prescribed interval; and

at least one external electrically conductive member which is electrically connected to said one main electrode and extends along the outer wall of said hollow cylindrical body in such a manner that said external electrically conductive member is capacitively coupled to said one electrically conductive member.

4,578,734

ELECTRONIC CIRCUIT CONTROLLING A MULTIPLE OPERATION APPARATUS FITTED WITH AN ELECTROMAGNETIC MECHANISM

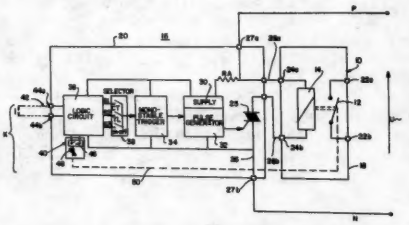
André Delbosse, Brussels, Belgium, assignor to Merlin Gerin, Grenoble, France

Filed Nov. 15, 1983, Ser. No. 551,935

Claims priority, application France, Nov. 29, 1982, 82 20111

Int. Cl.[4] H01H *47/32*

U.S. Cl. 361—152 **6 Claims**



1. Control device of an electrical apparatus having a movable contact and an electromagnetic driving mechanism with an electromagnetic coil inducing a change in condition of the movable contact at each time the electromagnetic coil is energized, said control device comprising a power supply circuit to said electromagnetic coil and a control unit inserted in said supply circuit to energize or de-energize the coil, said control unit including a controlable static switch and an electronic control circuit capable of delivering control pulses for the triggering of said static switch for a predetermined time-length T, so as to limit the current supply passing through said electromagnetic coil, said electronic control circuit including:

a synchronous pulse generating circuit to trigger said static switch when the voltage of said power supply circuit drops close to zero;

a monostable trigger circuit for supplying the pulse generating circuit with a single pulse of time-length T, and;

a logic control unit having an output connected to the input of said trigger circuit;

said logic control unit comprising a plurality of outputs delivering distinct output signals according to the condition of input signals applied to the input of the logic control unit; and

a selector connected between said logic control unit and said monostable trigger circuit to choose the operating mode

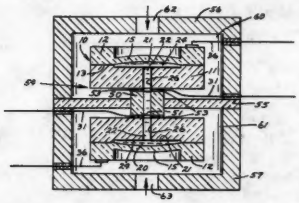
of said apparatus, the number of positions of said selector being identical to the number of logic control unit outputs.

4,578,735

PRESSURE SENSING CELL USING BRITTLE DIAPHRAGM

Thomas A. Knecht, 12309 Woodbine Rd., Minnetonka, Minn. 55343; Roger L. Frick, 125 Choctaw Cir., Chauhassen, Minn. 55317, and John P. Schulte, 923-11th Ave. South, Apartment 1, Hopkins, Minn. 55343

Filed Oct. 12, 1984, Ser. No. 660,394
Int. Cl.[4] H01G 7/00; G01L 9/12
U.S. Cl. 361—283 31 Claims



1. A differential pressure sensor assembly having first and second sensor portions;

said first and second sensor portions each comprising a pair of plates, a first of which is a brittle semiconductor material, and a second of which is a rigid insulating material, said plates initially being substantially contiguous to each other along first surfaces of said plates and sealed together along an encompassing line with portions of said first surfaces being unconnected to permit movement of said first semiconductor plate of each sensor portion relative to the other plate of the same sensor portion to form first and second chambers, respectively, in each of the first and second sensor portions;

each of said second plates having capacitive electrode means on the first surfaces thereof facing said semiconductor plates of the respective sensor portion to permit measuring differences in spacing of said facing surfaces by measurement of capacitance between the semiconductor plate and the capacitive electrode;

fluid conduit means for connecting said first and second chambers, respectively;

a quantity of substantially incompressible fluid filling said first and second chambers and to said fluid conduit means to space the semiconductor plates from the second plates;

housing means to permit subjecting at least one of the plates of each sensor portion to a pressure tending to move the plates forming each sensor portion together, the pressure acting on the respective sensor portion being at least at times different from the pressure acting on the other sensor portion, whereby the incompressible fluid will be forced into one chamber from the other chamber and cause increase in bending stress of the plates in one of said sensor portions and a decrease in bending stress of the plates of the other sensor portion; and

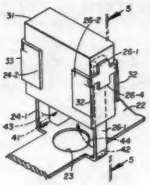
said other sensor portion reaching a condition wherein the first and second surfaces of the plates forming the other chamber are substantially contiguous before either of the plates forming the one sensor portion reach an excessive stress level.

4,578,736

SURFACE MOUNTED ELECTRICAL COMPONENTS AND METHOD OF FABRICATION

Donald R. Brown, Downers Grove, Ill., assignor to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Aug. 28, 1984, Ser. No. 645,194
Int. Cl.[4] H01G 1/14, 7/00
U.S. Cl. 361—306 11 Claims



1. An electrical component assembly which comprises:

an electrical device having electrodes on opposite ends;

a housing encasing said electrical device and having a bottom wall, two end walls, and two opposed side walls; and

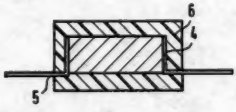
a pair of T-shaped terminals, each of which includes a stem section bonded to a separate one of said electrodes and extending through one of said end walls to a cross member which extends across said one of said end walls with end sections exposed on the opposite side walls of said housing so that the electrical component assembly exhibits a multi-surface plurality of pairs of electrical terminations adapted for the surface mounting thereof in a plurality of different orientations, whereby said plurality of pairs of electrical terminations include end portions of the stem sections proximate to the bottom wall, the exposed end sections of the cross members on one of the side walls of the housing, and the exposed end sections of the cross members on the other side wall of the housing.

4,578,737

SYNTHETIC RESIN FILM WOUND CAPACITOR

Wolfgang Westermann, Schellingstr. 7, D-6800 Mannheim 1, Fed. Rep. of Germany

Filed Jun. 4, 1984, Ser. No. 617,014
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1983, 3320257
Int. Cl.[4] H01G 1/13, 4/08, 7/00
U.S. Cl. 361—308 20 Claims



1. A capacitor formed in a chip configuration, which has predetermined electrical properties and shape, comprising:

a capacitor body comprised of a wound body of synthetic resin film;

a moisture-proof casing surrounding the capacitor body, comprising a material which retains its shape under the application of heat; and

a plurality of connecting elements fastened to the frontal sides of the capacitor body and projecting through the casing, each of said connecting elements comprising thin sheet metal having relatively poor thermal conductivity, said connecting elements being formed such that a first part of the sheet metal is disposed substantially parallel to and adjacent the frontal side of the capacitor body and a second part of the sheet metal projects through the casing

at an angle with respect to the frontal side of the capacitor body,

said capacitor retaining said predetermined shape and electrical properties when exposed to temperatures characteristic of liquid solder metal.

4,578,738

ANODE STRUCTURE FOR ELECTROLYTIC FIBRE CAPACITORS AND METHOD FOR MANUFACTURING THE SAME

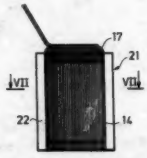
Leszlauer Zoltán, Batthyány tér 13, 9022 Győr, Hungary

Filed Nov. 9, 1984, Ser. No. 670,405

Claims priority, application Hungary, Nov. 11, 1983, 38060/83

Int. Cl.[4] H01G *4/16, 1/13, 7/00*

U.S. Cl. 361—324 **14 Claims**



1. Anode structure for use in an electrolytic capacitor, comprising a plurality of fibres extending substantially in parallel to each other, said fibres having at least their outer portion made of a valve metal, an oxide layer on an active section of said fibres, an electrically insulating resin hermetically sealing and mechanically interconnecting a section of each fibre adjacent to and leaving free said active section, an electrically conductive resin surrounding the oxide free end sections of said fibres to provide electrical interconnections between said fibres, said conductive resin constituting an electrical outlet for said structure and being spaced by said insulating resin from said active section.

4,578,739

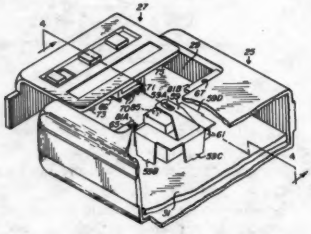
QUICK DISCONNECT AND FUNCTION CHANGE RADIO ASSEMBLY

John M. McKee, and John F. MacDonald, both of Coral Springs, Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 310,697, Oct. 13, 1981, abandoned. This application Apr. 19, 1983, Ser. No. 486,474

Int. Cl.[4] H05K *1/18, 11/00*

U.S. Cl. 361—395 **12 Claims**



1. An assembly for devices having a generic circuit portion and a unique circuit portion, said assembly comprising,

a main housing for said generic circuit portion having at least one inside wall and at least one outside wall,

a subassembly housing for said unique circuit portion, having an inside and outside wall,

a circuit board within said main housing for the components of said generic circuit portion, said circuit board having a first and second end, and slideable within said main housing between a first and second position,

a tongue-like projection having a first end attached to said circuit board and having a second end with a central slot,

a wedge integral with said inside wall of said main housing and engagng said tongue-like projection central slot so as to limit the amount said circuit board can slide in a first direction, to said first position,

a receiving cavity in said subassembly housing for receiving and engaging said tongue-like projection,

a first signal conducting connector mounted on said subassembly housing,

a second signal conducting connector mounted on said circuit board for engagement with said first signal conducting connector when said circuit board slides in a second direction, to said second position,

a flange mounted on said subassembly housing to receive and engage said circuit board first end when said circuit board slides to said second position, and

whereby said flange engagement of said circuit board first end and said tongue-like projection engagement of said receiving cavity provides a mechanical coupling which locks said main housing and said subassembly housing together.

4,578,740

HEADLAMP WITH ADJUSTABLE REFLECTOR FOR MOTOR VEHICLES

Jacky Krizmanic, Sens, France, assignor to Societe de Signalisations Automobiles S.E.I.M.A., Sens, France

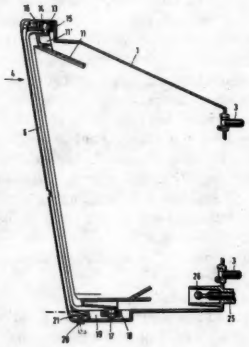
PCT No. PCT/EP83/00179, § 371 Date Mar. 9, 1984, § 102(e) Date Mar. 9, 1984, PCT Pub. No. WO84/00332, PCT Pub. Date Feb. 2, 1984

PCT Filed Jul. 8, 1983, Ser. No. 596,467

Claims priority, application France, Jul. 16, 1982, 82 12512

Int. Cl.[4] B60Q *1/06*

U.S. Cl. 362—66 **6 Claims**



1. In a headlamp with an adjustable reflector for a motor vehicle, comprising a housing mounted on the body of the vehicle and a cover disc which is attached to the housing by means of a groove-rib connection, and a reflector arranged in the housing, which is horizontally and vertically adjustable, the improvement wherein the reflector carries on its circumference a joint ball which rotates in a bearing connected to the housing on the cover disc, and the reflector also has on its circumference an axle which is located substantially in the same horizontal plane as the joint ball and is rotatable in a shoe which is secured in the housing with substantially horizontal sliding mobility, said bearing and shoe being accommodated in spaces which are located in alignment behind at least one groove-rib connection of the cover disc on the housing, a front

closure of the spaces and continuity of the shape of the connecting edge zone being achieved simultaneously by a packing of the bearing with an end profile of the groove and rib type and by a bent edge of at least one cover, for a partial section of the groove-rib connection which closes at least the accommodating space the shoe, the rear surface of the reflector carrying an actuating rod, which is located in said horizontal plane, and a second actuating rod which is arranged in another horizontal plane.

4,578,741

VEHICLE LIGHT WITH SEVERAL INCANDESCENT LAMPS HAVING IMPROVED CONTACT MEANS

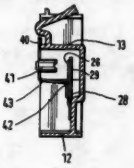
Hans Prohaska, Bietigheim-Bissingen, Fed. Rep. of Germany, and Daniele Sosthene, Draney, France, assignors to ITT Industries, Inc., New York, N.Y.

Filed Jul. 21, 1982, Ser. No. 400,453

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1981, 3131018

Int. Cl.[4] B60Q *1/26*; F21V *21/00*

U.S. Cl. 362—249 **8 Claims**



1. A vehicle light assembly for retaining at least one incandescent lamp, each lamp having a base with a cap connection and at least one center contact, comprising: a lamp holder having at least one cup formed therein and associated with each lamp for receiving said base; at least one metal conductor associated with each lamp and secured to the lamp holder, each metal conductor being insulated from one another; an end portion integral with each metal conductor and extending into each cup for electrical connection with the center contact of each lamp; a spring located within each cup in contact with the end portion, a portion of said spring urging said end portion upwardly in connection with the center contact of the lamp; and a portion of the spring opposite from the center contact located in a recess formed in the lamp holder, so that each spring is securely affixed to the lamp holder, and maintains the end portions of each metal conductor in constant contact with the lamps upon their insertion into the lamp holder wherein the spring includes a first shank in contact with the end portion of at least one metal conductor, a web perpendicular to the first shank, and a second shank perpendicular to the web and affixed to the lamp holder, whereby the shanks and web extend in a plane parallel to a plane including at least one metal conductor.

4,578,742

REMOVABLE LAMPHOLDER

Roy S. Klein, Erie; Joel C. Gehly, McKean, and Joseph T. Sestak, Erie, all of Pa., assignors to American Sterilizer Company, Erie, Pa.

Filed Oct. 24, 1984, Ser. No. 664,356

Int. Cl.[4] F21V *25/02*

U.S. Cl. 362—294 **14 Claims**

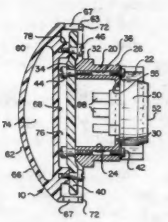
1. A lampholder for insertion into an electrically powered lighting unit comprising:

a socket for receiving the lamp;

means for communicating electrical power from the unit to the lamp;

a member having a bore therethrough for receiving said socket;

a cap structured to prevent cracking superposing said socket and being made of a material selected from the group consisting essentially of polysulfone, polyether sulfone, polyether imide, polyamide-imide, polyether ether ketone, polyphenylene sulfide or an epoxy or a phenolic, said cap having an upper surface, a lower surface so disposed relative to said upper surface that a first airspace is defined therebetween, a heat insulation layer disposed between said member and said lower surface, said heat insulation layer being made from said material and being so connected to said lower surface that a second airspace is



defined therebetween, an annular skirt and a plurality of windows formed in said skirt of sufficient size to vent so much of the heat emitted from the lamp when electrical power is communicated thereto, that said upper surface, due to the combination of said material, said first and second airspaces and said sufficiently sized windows, will not exceed a predetermined temperature during normal use;

a handle molded on said upper surface; and

means for releasably engaging the unit.

4,578,743

CONVERTER CONTROL SYSTEM HAVING STABLE POWER TRANSFER IN THE PRESENCE OF DECREASED INPUT AC VOLTAGE

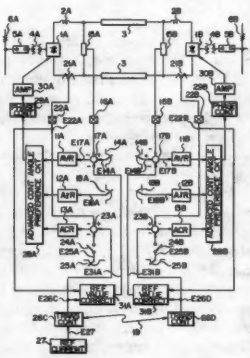
Haruhisa Inokuchi, and Takami Sakai, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 21, 1984, Ser. No. 622,877

Claims priority, application Japan, Jun. 21, 1983, 58-111383

Int. Cl.[4] H01J *3/36*

U.S. Cl. 363—35 **8 Claims**



1. A converter control system comprising:

first converter means for converting AC electric energy from a first AC power line into converted DC electric energy, said first converter means being located at a first given place;

DC power transmission means for transmitting the converted DC electric energy from said first converter means to a second given place which is different from said first place, and providing transmitted DC electric energy at said second given place;

second converter means located at said second given place, for converting the transmitted DC electric energy from said DC power transmission means into converted AC electric energy, and supplying the converted AC electric energy to a second AC power line;

current regulator means for actuating said first converter means to determine the amount of a DC rated current flowing through said first converter means;

voltage controller means for actuating said second converter means to determine the voltage of said transmitted DC electric energy; and

voltage correction means for actuating said voltage controller means to provide a voltage change portion in the voltage of said transmitted DC electric energy, so that the voltage of said transmitted DC electric energy is decreased by said voltage change portion when a DC current flowing through said second converter means is decreased.

4,578,744

A. C. POWER CONVERTER

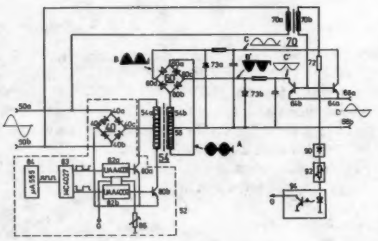
Jovan Antula, 19 Trappentreustrasse, Munich, Fed. Rep. of Germany

Filed Jun. 29, 1983, Ser. No. 509,163

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1982, 3224636

Int. Cl.[4] H02M *5/45*

U.S. Cl. 363—37 **20 Claims**



1. An a.c. power converter circuit for converting input alternating power of predetermined waveform, predetermined frequency and predetermined first amplitude into an output alternating power having the said predetermined waveform and frequency and a predetermined second effective voltage, said circuit having

first and second input terminals for receiving said input alternating power;

means (**52**) for periodically interrupting or chopping said input power, said means operating with a chopping frequency which is substantially higher than said predetermined frequency;

a transformer (**54**) dimensioned for said chopping frequency and having primary (**54*a***) and secondary (**54*b***) windings, said primary winding (**54*a***) being coupled in series with said interrupting or chopping means (**52**) across said input terminals and said secondary winding having a center tap (**56**),

said converter circuit comprising

a full wave rectifier circuit (**60**) coupled to said secondary winding (**54*b***) of said transformer (**54**), receiving the output (A) therefrom, and having two outputs (**56**, **58*a***; **56**, **58*b***) for providing first and second unipolar voltages (B, B') of opposite polarities with respect to the center tap (**56**), said center tap forming a common terminal of the rectifier circuit;

two electronic switches (**64*a***, **64*b***), one each being coupled between a respective rectifier output (**58*a***, **58*b***) and a first converter output terminal (**66*a***);

a second converter output terminal (**66*b***) coupled to the common terminal (**56**) of said rectifier circuit (**60**); and

a control circuit (**70**) coupled to and responsive to said input alternating power in synchronism with and at said predetermined frequency and connected to said electronic switches (**64*a***, **64*b***), said control circuit controlling said electronic switches to become alternately conductive in synchronism with said predetermined frequency during half cycles of the input power corresponding to respective portions of said unipolar voltages (B, B') which correspond to alternating successive half-waves of said input power to thereby reconstitute said predetermined wave form and frequency.

4,578,745

SEMICONDUCTOR VALVE

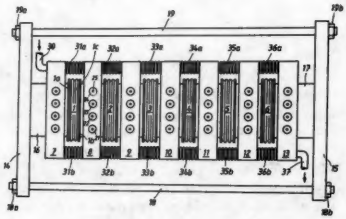
Karl-Erik Olsson, Ludvika, Sweden, assignor to ASEA AB, Vasteras, Sweden

Filed Oct. 2, 1984, Ser. No. 656,847

Claims priority, application Sweden, Oct. 6, 1983, 8305503

Int. Cl.[4] H02M *1/00*; H01L *1/00*

U.S. Cl. 363—68 **10 Claims**



1. A semiconductor valve including

a plurality of electrically series-connected semiconductor elements and a plurality of liquid-cooled cooling bodies,

the semiconductor elements and the cooling bodies being arranged alternately one after the other in a stack having a longitudinal direction so that a semiconductor element is disposed between two cooling bodies,

clamping means generating a compressive force acting in the longitudinal direction of the stack to press said elements and cooling bodies together, and

voltage divider sections connected in parallel with each semiconductor element, each said voltage divider section including at least one resistor,

characterized in that,

at least one resistor of at least one voltage divider section has a main portion of elongated substantially cylindrical shape, which main portion is located inside one of said cooling bodies with its elongate direction substantially perpendicular to the longitudinal direction of the stack.

4,578,746

INTERLACED PULSE-WIDTH MODULATED UNRESTRICTED FREQUENCY CHANGER SYSTEM

Laszlo Gyugyi, Penn Hills; Theodore M. Heinrich, Murrysville, both of Pa., and Gyu-Hyeong Cho, Seoul, Rep. of Korea, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 3, 1984, Ser. No. 596,329

Int. Cl.[4] H02M *5/257*

U.S. Cl. 363—161 **5 Claims**

1. In a frequency conversion apparatus having a plurality of phase-related static converters each coupled between a poly-

phase AC power source of frequency f_{IN} and a polyphase AC output of frequency f_0 including:

for each of said converters a plurality of controllable bilateral switching units controlled for conduction in succession during a time period (TP) characterizing said frequency f_0, each switching unit having a controllable conduction time interval (t) within a common time frame (T) defined by a controllable repetition rate, and occurring through said succession at said repetition rate to derive energy from said AC power source through the associated converter during successive segments of voltage, on a phase basis, and to apply the derived voltage segments of said succession to said output so as to form with associated like pluralities of converter switching units an AC polyphase output system;

the frequency f_0 of said AC output being a function of the difference between the frequency f_{IN} of said AC power source and said repetition rate; the combination of:

means synchronized with said repetition rate and operative on said controllable conduction time interval (t) for establishing with said succession of switching units n elementary conduction time intervals (t^*) distributed throughout the time frame (T) of operation of each switching unit in said succession and occurring at a rate which is n time said repetition rate, the sum of said elementary conduction time intervals (t^*) within such time frame (T) being equal to said controllable conduction time interval (t), n being an integer in relation to the output frequency of said AC output; and

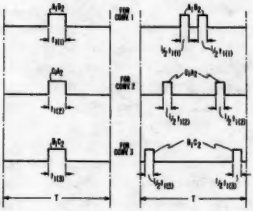
means for controlling the switching units of said succession each one n times before controlling another, thereby to improve the quality of the current in the AC output and in the input AC power source with said n time intervals establishing means comprising:

means for repeatedly generating for each phase converter a timing wave of duration T;

means for applying a reference voltage in relation to said AC output;

means for comparing each of said timing waves with said reference voltage to derive a duration signal of said t duration, said timing waves being such that n comparisons are effected per timing wave within said time frame T, a subsignal of elementary conduction time interval (t^*) being derived upon each such comparison; and

said timing waves being displaced by the same amount in relation to one another, thereby to effect interlacing between said subsignals from one converter to another.



4,578,747

SELECTIVE PARAMETRIC SELF-CALIBRATING CONTROL SYSTEM

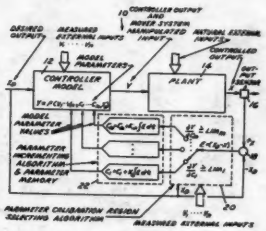
Laszlo Hideg, Dearborn Heights, and Paul L. Koller, Wyandotte, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

PCT No. PCT/US83/01606, § 371 Date Oct. 14, 1983, § 102(e) Date Oct. 14, 1983, PCT Pub. No. WO85/01807, PCT Pub. Date Apr. 25, 1985

PCT Filed Oct. 14, 1983, Ser. No. 553,323

Int. Cl.[4] G05B *13/04*

U.S. Cl. 364—151 **1 Claim**



1. In a controlled system having a control means supplying a manipulated input to a plant, said control means having a first plurality of external inputs designated V, measurable by sensing means, and a second plurality of input control model parameters designated C, alterable in said controlled system by calibration means, said control means including a predetermined mathematical model to compute a desired controlled system output X_D into a manipulated input Y as a function of V and C, a method for operating the controlled system to meet specified system output requirements comprising the steps of:

establishing an initial value for input control parameters, C;

measuring external inputs, V;

generating an initial model for generating a manipulated input, Y, from a desired controlled system output, X_D, as a function of V and C; and

correcting the input control model parameters C as a function of the difference between the desired controlled system output X_D and the actual controlled system output, X, and as a function of measured external inputs, V, by including the steps of comparing the actual controlled system output to the desired controlled system output and generating an output error; measuring external inputs V; and updating sequentially the values of the input control parameters as a function of output error and measured external inputs, V;

said step of updating sequentially including:

selecting the input control parameter having the largest contribution to the output error, by taking the partial derivative of the manipulated input, Y, with respect to each of the input control parameters; determining whether each of the partial derivatives is within predetermined boundaries; selecting to adjust the value of that input control parameter associated with the largest partial derivative; and

adjusting the value of the selected input control parameter to reduce the output error, by incrementing the previous value of the control parameter by an amount proportional to the integral of the output error during a predetermined period of time, so that $C(1)=C(0)+K\int \epsilon dt$

wherein C(1) is the updated parameter

C(0) is the previous parameter

K is a constant

ϵ is the output error defined by the difference between the actual and the desired controlled system output.

4,578,748

POSITIONING CONTROL SYSTEM

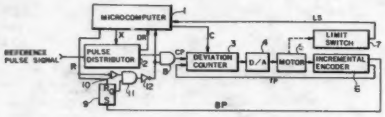
Riichi Abe; Katsuji Tsuruta, both of Hiratsuka, and Seiji Tsujikado, Sagamihara, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Sep. 29, 1982, Ser. No. 427,926

Claims priority, application Japan, Oct. 26, 1981, 56-171063; Dec. 23, 1981, 56-208850

Int. Cl.[4] G05B *11/18*

U.S. Cl. 364—167 5 Claims



5. In a position control system having a motor for driving an object to be transferred and an incremental encoder mounted to a rotary shaft of said motor, said incremental encoder detecting relative position of the object with respect to an origin position, wherein the rotational speed of said motor is determined based on difference in the number of pulses between a command pulse signal, wherein the number of pulses per unit time period corresponds to a transfer rate of said object and a feedback pulse signal supplied from said incremental encoder, wherein the number of pulses per unit time period corresponds to the actual rotational rate of said motor, the frequency of said command pulse signal being controlled by programs to determine said transfer rate of said object, and wherein the stop position of said object is determined based on an origin pulse signal supplied from said incremental encoder, the improvement comprising:

means for generating an origin detection signal when said object nears a certain transfer destination position,

a logic circuit for causing said frequency of the command pulse signal to be reduced when said origin pulse signal next is supplied after generation of said origin detection signal; and

rotation reversing means, cooperating with said logic circuit, for driving said motor in the reverse rotation direction with said command pulse signal of reduced frequency,

and wherein said logic circuit thereafter causes said command pulse signal to terminate when the origin pulse signal is again generated, said system further comprising;

means for comparing a value corresponding to the amount of rotation that said motor is expected to be rotated during a period from said initially supplied origin pulse signal to the stop of said motor with a value showing the amount of rotation that said motor has rotated during a period from the instant that the motor rotation is reversed to the time when said origin pulse signal again is generated, whereby an appropriate error compensation measure is taken when said two total numbers of rotation do not coincide with each other.

4,578,749

METHOD FOR MEASURING DRIVING AMOUNT OF MOTOR AND APPARATUS THEREFOR

Toshitaka Kuno, Nagoya, and Atsushi Kamiya, Kariya, both of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed Jun. 20, 1983, Ser. No. 506,125

Claims priority, application Japan, Jun. 23, 1982, 57-108146; Jun. 23, 1982, 57-108147

Int. Cl.[4] G05B *19/00*

U.S. Cl. 364—167 18 Claims

5. An apparatus for measuring a driving amount of a motor, comprising:

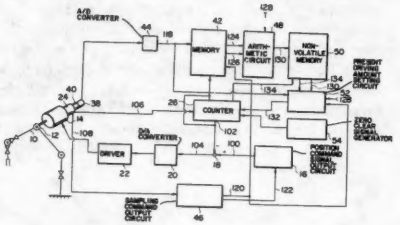
an encoder of an increment type mounted on a driving shaft of the motor and putting out driving amount pulses of the number corresponding to a driving amount of the motor;

a counter counting the number of the driving amount pulses on the basis of an origin of the motor to detect a relative driving amount of the motor;

an absolute driving amount detector detecting an absolute driving amount of the motor;

a sampling command output circuit putting out a driving amount sampling command signal at each predetermined interval of the driving amount pulses;

a coefficient and constant calculating circuit for sampling the relative driving amounts and the absolute driving amounts in response to the respective driving amount sampling command signals and obtaining coefficient and constant of at least one linear approximate equation representing the relation between the relative driving amount and the absolute driving amount from the respective sampled relative and absolute driving amounts;



a non-volatile memory for the coefficient and constant of the linear approximate equation obtained in the coefficient and constant calculating circuit therein; and

a present driving amount setting circuit for obtaining a relative driving amount of the motor at a starting time of the motor in a sampling position from the coefficient and constant read out of the non-volatile memory and an absolute driving amount sampled in response to the driving amount sampling command signal when the motor is driven from a present rotational position of the motor up to the sampling position near the present rotational position, and setting the relative driving amount of the motor at the starting time in the counter.

4,578,750

CODE DETERMINATION USING HALF-ADDER BASED OPERAND COMPARATOR

Gene M. Amdahl, Atherton; Hsiao-Peng S. Lee; Stephen J. Rawlinson, both of Sunnyvale, and Stephen F. Stuart, Mountain View, all of Calif., assignors to Amdahl Corporation, Sunnyvale, Calif.

Filed Aug. 24, 1983, Ser. No. 526,047

Int. Cl.[4] G06F *9/00, 7/00*

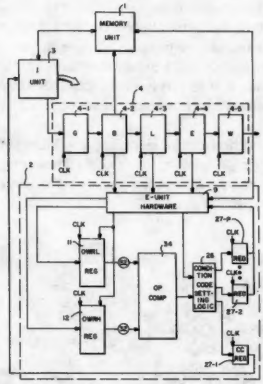
U.S. Cl. 364—200 24 Claims

1. A data processing system operating in response to instructions, where the instructions specify the operations to be executed and the operands to be utilized in executing the instructions, said instructions including a branch instruction specifying a branch instruction stream to be taken in accordance with a condition code identified by said branch instruction, and including a condition code-setting instruction specifying an operation to be executed and first and second operands to be utilized in executing the condition code-setting instruction, comprising:

instruction means for processing instructions, including said condition code-setting instruction, and for selecting said branch instruction stream as a function of the setting of said condition code;

comparator means for comparing said first and second operands specified by said condition code-setting instruction to form a comparison result, said comparator means including one or more half-adders receiving said first and second

operands and operative to form said comparison result for predicting codes,



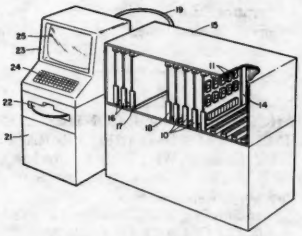
means responsive to said comparison result in said comparator means for setting said condition code without the necessity of waiting for the execution of the operation specified by said code-setting instruction.

4,578,751

SYSTEM FOR SIMULTANEOUSLY PROGRAMMING A NUMBER OF EPROMS

Edward A. Erwin, Mesquite, Tex., assignor to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Jun. 25, 1982, Ser. No. 392,053
Int. Cl.[4] G06F *9/00, 13/00*
U.S. Cl. 364—200 **1 Claim**



1. A system for simultaneously programming a plurality of erasable programmable read only memory devices (EPROMs), each having a number of memory sites that are each initially set in all-ones condition, which comprises:

a central processing unit;

means for rotating a program comprising a plurality of successive bytes from a master memory device and storing said program in said central processing unit;

a cabinet rack for receiving multiple circuit boards each having several EPROMs, each having all of its memory sites set in the "all-ones" condition;

an interface circuit interposed between said cabinet rack and said central processing unit for transmitting successive bytes comprising bits of ones and zeros to set each memory site accordingly and for subsequently reading the setting of each memory site back into said central processing unit;

means within the central processing unit for transferring each byte of the program to said interface circuit for impression at successive memory sites;

means within the central processing unit for recognizing bytes of all ones and blocking the impression of said "all-ones" bytes-bits to said interface; and

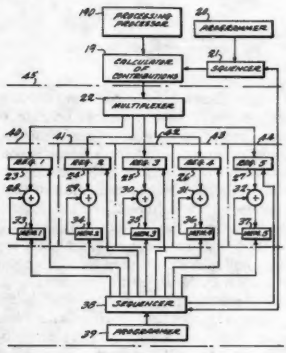
means within the central processing unit for receiving through said interface circuit the byte setting of each programmed memory site and for verifying said setting with respect to the byte impressed through the interface circuit to the memory site, and for verifying the "all-ones" setting of those memory sites associated with the blocked "all-ones" byte recognized in the central processing unit.

4,578,752

TOMODENSITOMETER FOR IMAGE DISPLAY IN THE DYNAMIC MODE

Rémy Klausz, Paris, France, assignor to Thomson CSF, Paris, France

Filed Dec. 21, 1982, Ser. No. 451,797
Claims priority, application France, Dec. 31, 1981, 81 24573
Int. Cl.[4] G06F *15/42*
U.S. Cl. 364—414 **6 Claims**



1. A method for producing in real time a plurality of tomodensitometric images of a planar section of a body being examined by a tomodensitometer having a radiation source, a radiation detector, and a plurality of accumulator memories, each tomodensitometric image having a plurality of picture elements, comprising the steps of:

allocating one accumulator memory to each tomodensitometric image it is desired to observe;

defining an area in each accumulator memory for each picture element of the corresponding tomodensitometric image;

radiating said body with said radiation source a plurality M of times, said radiation source being angularly displaced with respect to said body for successive radiations;

acquiring M projections of radiations passing through said body with said radiation detector, M being greater than a number N minimum projections required to form a tomodensitometric image of said planar section, M and N being positive integers;

calculating, independently for each acquired projection, a contribution each acquired projection makes to each of said plurality of tomodensitometric images, each contribution being allocated to a picture element within each tomodensitometric image to which said contribution is assigned;

entering each calculated contribution into accumulator memory areas corresponding to picture elements to which said contribution is allocated; and

producing real time consecutive tomodensitometric images from said plurality of accumulator memories, each accu-

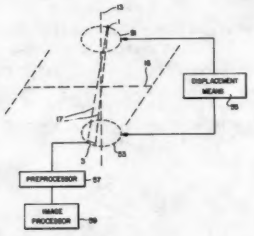
mulator memory corresponding to one tomodensitometric image.

4,578,753

SYSTEMS AND METHODS FOR MINIMIZING NONCOPLANARITY ARTIFACTS

Carl R. Crawford, Milwaukee, Wis.; Yair Shimoni, Jerusalem, Israel; A. Robert Sohval, and Daniel I. Barnea, both of Brookline, Mass., assignors to Elscint Ltd., Haifa, Israel

Filed Aug. 29, 1983, Ser. No. 527,472
Int. Cl.[4] G06F *15/42*
U.S. Cl. 364—414 **20 Claims**



10. A correction method for minimizing artifacts caused by noncoplanarity between source means and detector means in computerized tomography, wherein said source means produces a beam of penetrating radiation which is rotatable about an axis and is incident on said detector means, whereby said noncoplanarity is defined by the collection of the positions of said source means which defines a first plane, and by the collection of the positions of said detector means which defines a second plane, said first and second planes being separated by a third plane that includes a portion of the object being scanned, said method including the steps of:

(a) energizing said source means to provide radiation that passes from said source means to said detector means through an object when the latter is located between said source means and said detector means whereby output signals from the detector means are obtained;

(b) processing said output signals to provide radiation intensity attenuation data of the object through 360 degrees; and

(c) forming two images from the data, one image from the data related to one side of said third plane, and the second image from the data related to the other side of said third plane.

4,578,754

VEHICLE BRAKE CONTROL APPARATUS AND METHOD

Arum P. Sahasrabudhe, Park Dune, India; Habib Dadpey, Upper St. Clair, Pa.; Fernando A. Cirillo, R. Joao De Sousa Dias; Antonia C. Merlo, Sao Paulo, both of Brazil, and Pierre A. M. Zuber, Baldwin Borough, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 5, 1984, Ser. No. 596,877
Int. Cl.[4] B61L *11/02*
U.S. Cl. 364—426 **12 Claims**

1. In brake control apparatus for a vehicle operative with a roadway having a known system design first deceleration and having a command speed to establish the vehicle actual speed in relation to that roadway, the combination of

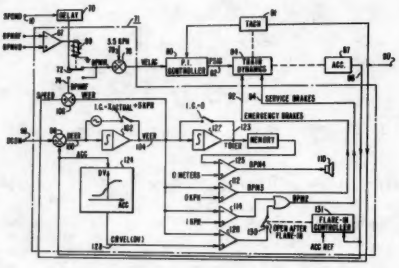
means including an accelerometer coupled with the vehicle for sensing a second deceleration of the vehicle,

means comparing the first deceleration and the second deceleration for determining a deceleration error of the vehicle,

means responsive to a change of said command speed from a higher value to a lower value for determining a safe brake velocity for the vehicle in accordance with the actual speed and a velocity error established in relation to said deceleration error, and

speed control means responsive to the safe brake velocity for controlling the actual speed of the vehicle until there is a predetermined relationship between the velocity error and a critical velocity established in relation to said second deceleration when the speed control means provides a deceleration of said vehicle in accordance with said velocity error.

6. In the method of decelerating a vehicle operative with a roadway having a known safe deceleration rate and having a command speed to determine the vehicle travel speed along that roadway, the steps of



sensing the actual acceleration of the vehicle,

sensing a decrease in the command speed for providing a safe brake speed relationship in accordance with the vehicle travel speed and a velocity error established in relation to the safe deceleration rate and the vehicle acceleration;

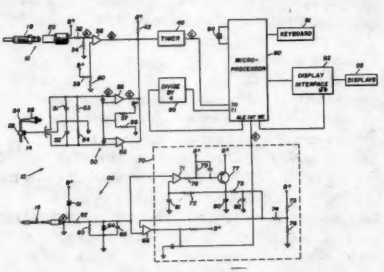
providing a first operation of the vehicle in response to the safe brake speed relationship until a predetermined velocity error is established in relation to the known safe deceleration rate and said actual acceleration and providing a second operation of the vehicle after said predetermined velocity error is established and in accordance with a desired deceleration rate.

4,578,755

MICROPROCESSOR CONTROLLED TIMING/TACHOMETER APPARATUS

Robert O. Quinn, Kenosha, Wis.; Craig F. Govekar, Gurnee, Ill., and James R. Piehl, Kenosha, Wis., assignors to Snap-on Tools Corporation, Kenosha, Wis.

Filed Nov. 12, 1982, Ser. No. 441,078
Int. Cl.[4] G01M *15/00;* G01P *21/02*
U.S. Cl. 364—431.01 **15 Claims**



9. Timing/tachometer apparatus for an internal combustion engine having a rotating part with mark means that passes a fixed point a predetermined offset angle after top dead center

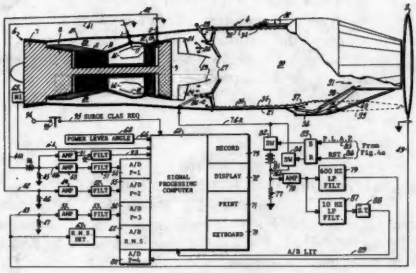
of a selected cylinder, said apparatus comprising a first sensor adapted to be coupled with respect to the selected cylinder for producing recurring first electrical signals in response to recurring combustion in the selected cylinder; first circuit means for converting the first electrical signals into a train of first pulses; a second sensor adapted to be mounted adjacent to the fixed point for producing recurring second electrical signals in response to recurring rotation of the rotating part; second circuit means for converting the second electrical signals into a train of second pulses; processor means coupled to said first and second circuit means and operating under stored program for: (a) determining the time between the pulses in one of the trains and converting such time into engine speed in rpm and if such one train is not present, then (b) determining the time between the pulses in the other one of the trains and converting the last-mentioned time into engine speed in rpm; and means for digitally displaying the engine speed.

4,578,756

ADAPTIVE ELECTROSTATIC ENGINE DIAGNOSTICS

David M. Rosenbush, Granby; Philip E. Zwicke, South Glastonbury, both of Conn., and Robert P. Couch, Palm Beach Gardens, Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 28, 1982, Ser. No. 454,125
Int. Cl.[4] G01M *15/00*
U.S. Cl. 364—431.02 **25 Claims**



1. Adaptive electrostatic diagnostic apparatus, operable in a plurality of modes, for power plants having a gas turbine engine including gas tubine engines with afterburners, operable in response to commands provided thereto, and providing first electrical signals indicative of such commands and of the oporation of such engine, comprising:

electrostatic signal means, including a probe to be disposed in the gas stream of an engine, for providing, when said probe is disposed in the gas stream of an operating engine, second electrical signals having amplitude variations therein in response to ionic phenomena in the gas stream of the engine in the vicinity of said probe; and

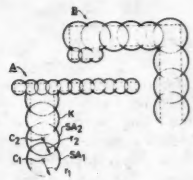
signal processing means connected for response to said first and second electrical signals, operative in a first diagnostic mode for providing a signal indicative of the occurrence of an operational event in said engine in response to a particular one of said second electrical signals provided thereto by said probe having characteristics indicative of said operational event, and for operating in another diagnostic mode different from said first mode in response to a selected one of said first and second electrical signals.

4,578,757

METHOD FOR PREVENTING COLLISION OF TWO MUTUALLY MOVABLE BODIES AND AN APPARATUS INCLUDING AN ARRANGEMENT FOR PREVENTING COLLISION

Johan S. H. Stark, Stockholm, Sweden, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 24, 1983, Ser. No. 469,364
Claims priority, application Sweden, Feb. 24, 1982, 8201149
Int. Cl.[4] B25J *9/00*
U.S. Cl. 364—461 **5 Claims**



1. An improved method to determine the risk of collision for two mutually movable bodies, whose movements are sensed by transducers for continuous monitoring of the position of the bodies during a motion, said method including the steps of:

determining repeatedly the position for the centrum of a number of virtual spherical subvolumes, whose outer circumferences together approximate the outer contour of each body during the motion; and

calculating the distance between the outer circumferences of those subvolumes which represent the outer contour of one of the bodies and the outer circumferences of those subvolumes which represent the outer contour of a second body by determining the centrum positions and the known diameters of the subvolumes; and

comparing each calculated distance with a safety distance; wherein the improvement comprises

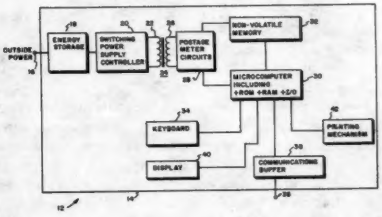
representing the spheres by cubes in the first calculation step thereby taking into account only the projections of the spheres on the axes in an orthogonal coordinate system at the distance determination between the spheres.

4,578,758

ELECTRONIC POSTAGE METER HAVING A REGULATED POWER SUPPLY SYSTEM RESPONSIVE TO A VOLTAGE DEVELOPED IN A TRANSFORMER PRIMARY WINDING CIRCUIT

Arno Muller, Westport, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Jun. 23, 1983, Ser. No. 506,957
Int. Cl.[4] G06F *15/20*
U.S. Cl. 364—466 **10 Claims**



1. In an electronic postage meter having means for printing postage and microcomputer means for monitoring the printing of postage by said printing means and said microcomputer,

means for supplying a source of operating potential external to said secure housing means, a system for energizing said microcomputer means, comprising:

transformer means having a primary winding and a secondary winding, said transformer means mounted within said secure housing means, said secondary winding operatively connected to said microcomputer means;

controlling means coupled to said primary winding and to said external source of operating potential for controlling the voltage applied to said primary winding, said controlling means operable to switch the voltage applied to said primary winding between a first condition wherein said primary winding is energized and a second condition wherein said primary winding is not energized, said controlling means including period varying means operable to vary the period of time said primary winding is energized and the period of time said primary winding is deenergized; said controlling means also including a terminal that is energized by a predetermined source of operating voltage and energizing means coupled to said controlling means for energizing said terminal at a voltage which is greater than said predetermined voltage to allow for proper operation of the controlling means; and

means coupled between said primary winding and said varying means of said controlling means for operating said varying means to vary the period of time said primary winding is energized and the period of time said primary winding is de-energized in response to a voltage established in said primary winding of said transformer during said period of time said transformer is de-energized.

4,578,759

SHEET DISTRIBUTING APPARATUS

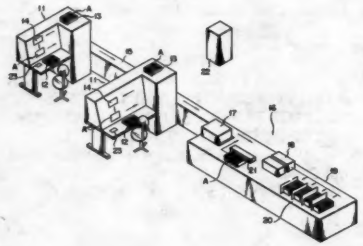
Tetsuo Horii, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 422,175, Sep. 23, 1982, abandoned. This application Mar. 29, 1985, Ser. No. 717,482

Claims priority, application Japan, Sep. 29, 1981, 56-154232

Int. Cl.[4] G06F *15/20*; G06K *5/00*; B07C *3/18*

U.S. Cl. 364—478 **3 Claims**



1. A method of sorting sheet mail comprising the steps of:

(1) inputting information corresponding to the name of the addressee of a piece of sheet mail;

(2) determining whether said name information identifies only one of a plurality of categories into which said sheet mail is to be sorted;

(3) inputting information corresponding to the street number of said addressee in response to a determination in said determining step (2) that said name identifies more than one of said plurality of categories;

(4) if a street number has been inputted in said inputting step (3), determining whether the combination of the name and street number information identifies only one of said plurality of categories;

(5) inputting information corresponding to a street name in response to a determination in said determining step (4) that the combination of said name and street number information identifies more than one of said plurality of categories;

(6) encoding the address of said addressee in response to said inputted information; and

(7) routing said sheet mail into one of said plurality of categories in response to said encoded address,

wherein said determining steps (2) and (4) and said encoding step (6) each include the step of searching an look-up table for entries corresponding to the inputted information, and wherein:

said look-up table comprises a plurality of respective entries, each of said plurality of entries comprising at least a name field, a name flag, a number address field, a number flag, a block field and a code field, the name flag of any entry being set only when the name field of that entry is the same as the name field of at least another one of said entries, the number address flag of an entry being set only when the name field and the number address field of that entry are the same as the name field and number address field, respectively, of at least another of said entries;

said determining step (2) includes the steps of:

searching said look-up table to locate an entry having a name field corresponding to said inputted name information, and

determining whether the name flag of said located entry is set;

said determining step (4) includes the steps of:

searching said look-up table to locate an entry having a name field and number address field which respectively correspond to said inputted name information and said inputted street number information, and

determining whether said number address flag of said located entry is set; and

said encoding step (6) includes the steps of:

searching said look-up table to locate an entry having a name field, number address field and block field corresponding to the inputted ones of said name information, street number information and street name information of said inputted information, and

extracting the contents of said code field from said located entry.

4,578,760

ARRANGEMENT FOR CONTROLLING AN ELECTRONIC TAXIMETER

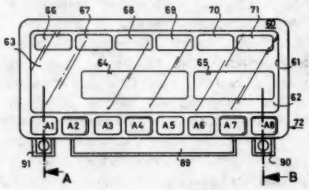
Jürgen Adams, and Hans-Peter Scholl, both of Villingen-Schwenningen, Fed. Rep. of Germany, assignors to Kienzle Apparate GmbH, Villingen-Schwenningen, Fed. Rep. of Germany

Filed Jan. 20, 1983, Ser. No. 459,671

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1982, 82100393

Int. Cl.[4] G07B *13/04*; G06F *15/20*

U.S. Cl. 364—467 **11 Claims**



1. In a system for controlling an electronic taximeter with respect to different switched states by means of keys which provide coded signals to an input circuit by way of a coder matrix, said taximeter having a housing, the improvement comprising:

a key strip provided on said housing, said strip for holding a

predetermined number of keys, up to a maximum number of keys;

a number of switches corresponding to the maximum number of keys being provided in said housing;

tariff memory means for storing tariff information;

system memory means for storing system program information; and

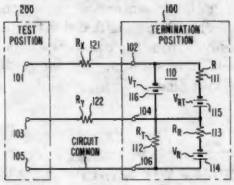
key information being stored in the tariff memory means for triggering different key interrogation cycles in the system program by means of which a plurality of functions are assignable to a key when a quantity of keys less than a predetermined number are available and for assigning only one function to a key when the available keys exceed said predetermined number.

4,578,761

SEPARATING AN EQUIVALENT CIRCUIT INTO COMPONENTS TO DETECT TERMINATING NETWORKS

Michael A. Gray, Parsippany, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 25, 1983, Ser. No. 478,877
Int. Cl.[4] G06F *11/00*
U.S. Cl. 364—481 **3 Claims**



1. A method for decomposing a derived three-mode equivalent circuit into first and second components, wherein said second component is a delta network from a class of terminations, said method comprising the steps of

apportioning said equivalent circuit into a segment representative of said first component and a delta circuit corresponding to said second component according to a partitioning algorithm, and

comparing each delta network in said class to said delta circuit until either a match occurs within preselected bounds or for a predetermined number of times returning to said step of partitioning.

4,578,762

SELF-CALIBRATING CARBON DIOXIDE ANALYZER

Jacob Y. Wong, Santa Barbara, Calif., assignor to Tri-Med Inc., Bellevue, Wash.

Filed Jul. 1, 1983, Ser. No. 509,920
Int. Cl.[4] G06F *15/46*; G01N *21/26*
U.S. Cl. 364—497 **10 Claims**

1. Optical-mechanical apparatus for a gas analyzer for generating electrical signals for continuously and automatically self-calibrating the electrical output comprising:

(a) a first chopper wheel containing openings occupied by two items of (1) vacuum cell, (2) reference cell, (3) open hole, (4) standard cell;

(b) a second chopper wheel containing openings occupied by the other two items of element "a" above;

(c) means for aligning the openings of the two wheels to define a path;

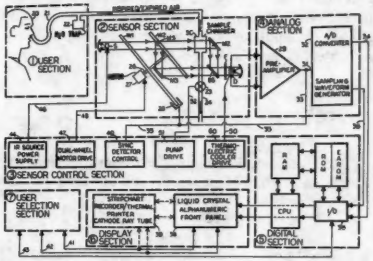
(d) means for rotating the two wheels in synchronism to align selected openings in the two wheels along said path;

(e) a source of radiant energy disposed at one end of said path;

(f) a sample chamber disposed along said path downstream from said wheels;

(g) an electrical transducer detector of radiant energy disposed at the other end of said path to create changes in electrical quantities,

whereby the detector creates values V_S, V_R, V_S', V_R', V_S'', V_R'', V_S^o, and V_R^o, for use in rendering the gas analyzer self-calibrating, and wherein these values are:



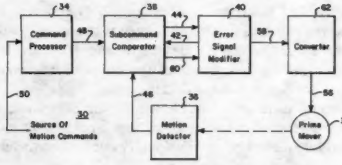
V_S: vacuum cell and open hole and sample cell,
V_R: reference cell and open hole and sample cell,
V_S': vacuum cell and standard cell,
V_R': reference cell and standard cell,
V_S'': vacuum cell and open hole,
V_R'': reference cell and open hole,
V_S^o: vacuum cell and standard cell and sample cell,
V_R^o: reference cell and standard cell and sample cell.

4,578,763

SAMPLED DATA SERVO CONTROL SYSTEM WITH DEADBAND COMPENSATION

Donald H. Jones, Pittsburgh; Spencer W. Allen, Murrysville, and Philip R. Chimes, Pittsburgh, all of Pa., assignors to International Cybernetics Corp., Pittsburgh, Pa.

Filed Aug. 15, 1983, Ser. No. 523,063
Int. Cl.[4] G05B *19/25*
U.S. Cl. 364—513 **21 Claims**



1. A sampled data system for controlling the motion of an object, said system including means for generating a command representative of the motion desired of said object, comprising:

means for processing said command by generating at least one series of subcommands, each subcommand representing a segment of said desired motion over a time period;

means for detecting at least one motion characteristic of the actual motion of said object and providing a signal representative thereof;

means for comparing at least one of said subcommands to at least one of said signals representative of said actual motion characteristic of the object and generating at least one error signal representative of the variation of a characteristic of the actual motion of the object from the corresponding characteristic of the motion represented by said subcommands;

means for so modifying said error signal that said system exhibits a set of desired performance characteristics, said

modifying means including means for reducing the effect that said error signals have on a motion characteristic of the motion of the object by performing on said error signals a function that includes a division of said error signals by a predetermined number accomplished in integer fashion, said reducing means so increasing the values of some of said error signals that the average value of said divided error signals approximates the value each said divided error signal would have had if said division had been performed in floating point fashion; and

means for converting a said modified error signal to a signal suitable for application to a prime mover which causes said object to exhibit said desired motion.

4,578,764

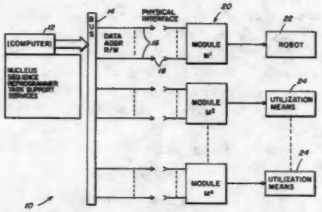
SELF-CONFIGURING ROBOTIC SYSTEM AND METHOD

Burleigh M. Hutchins, Hopkinton; William J. Buote, Natick, and Lawrence J. Finn, Westborough, all of Mass., assignors to Zymark Corporation, Hopkinton, Mass.

Filed Mar. 7, 1983, Ser. No. 472,642

Int. Cl.⁴ G06F *9/00*

U.S. Cl. 364—513 **10 Claims**



1. A robotic system comprising:

a robotic device means;

a first module means for providing all of the intelligence for said robotic device means, said module means being electrically connected to said robotic device means;

computer means;

a first physical interface means for providing a plurality of separable electrical connections between said computer means and said first module means so that all of the intelligence for the robotic device means is located on the robotic device means side of the physical interface means;

means for performing a defined task;

a second, different, module means for providing all of the intelligence for said defined task performing means, said module means being electrically connected to said defined task performing means; and,

a second physical interface means for providing a plurality of separable electrical connections between said computer means and said second module means so that all of the intelligence for the defined task performing means is located on the defined task performing means side of the physical interface means.

4,578,765

IMAGE COMPARISON SYSTEMS

John C. Barker, Oakington, England, assignor to Cambridge Instruments Limited, Cambridge, England

Filed Oct. 18, 1983, Ser. No. 543,037

Claims priority, application United Kingdom, Nov. 2, 1982, 8231267

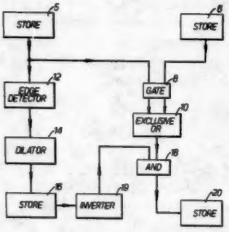
Int. Cl.⁴ G06K *9/00*

U.S. Cl. 364—514 **7 Claims**

1. An image comparison system for carrying out a comparison between a first electrical signal set and a second electrical signal set which represent respective and nominally identical images, comprising

means responsive to the first signal set for producing therefrom a third signal set representing the peripheral edge region of the image corresponding to the first signal set,

signal processing means responsive to the third signal set for producing therefrom a modified third signal set representing a dilated version of the said peripheral edge region,



first signal comparison means for comparing the first and second signal sets whereby to produce a difference signal set representing the signal differences therebetween, and

second signal comparison means for comparing the difference signal set with te modified third signal set whereby to tend to remove from the difference signal set any difference signals corresponding to image differences lying within the said dilated peripheral edge region.

4,578,766

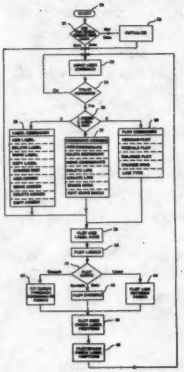
COMPUTER-AIDED PROCESS FOR GENERATING CAMERA-READY GRAPHICAL ARTWORK

Michael J. Caddy, Doylestown, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 1, 1983, Ser. No. 528,710

Int. Cl.⁴ G06F *15/06*; H04N *7/00*

U.S. Cl. 364—521 **5 Claims**



1. A process for generating a camera-ready hardcopy of a graphical plot of certain physical quantities or existing plots using a general purpose digital computer, a graphics display terminal having an alpha-numeric keyboard and a cursor control, and an associated printer, comprising in sequence the steps of:

storing in the computer an interactive graphics code and coordinate data in tabular form associated with the physical quantities or existing plots, said code being identified

by interactive command repetition and feedback for deletion, addition and transition of lines, points and labels while processing the stored coordinate data;

plotting on the screen the stored coordinate data in a format according to said code;

generating on the screen lines between the plotted coordinate data according to said code;

revising the coordinate data and the lines plotted on the screen by manipulating the cursor and keyboard in accordance with said code, said revising step further including

adding coordinate data to create new lines,

deleting coordinate data to remove lines, and

moving coordinate data to change the position of existing lines; and

printing a hardcopy of the revised plot on the printer.

4,578,767

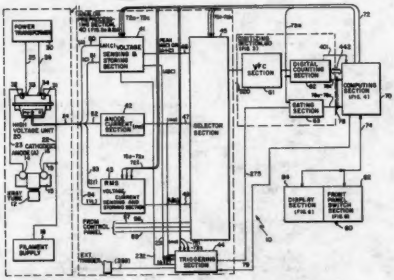
X-RAY SYSTEM TESTER

Jonathan S. Shapiro, Cos Cob, Conn., assignor to Raytheon Company, Lexington, Mass.

Filed Oct. 2, 1981, Ser. No. 307,811

Int. Cl.[4] G06F *15/20*; H05G *1/26*

U.S. Cl. 364—550 **14 Claims**



1. Apparatus for measuring a plurality of operating voltages and currents of an X-ray system comprising:

means for providing a first plurality of output analog signals, each one being representative of a corresponding one of the plurality of operating voltages and currents of the X-ray system;

means for producing a second plurality of output analog signals, each one corresponding to an operator selected signal;

means responsive to a control signal for coupling one of the first plurality of output analog signals and the second plurality of output analog signals to an output thereof selectively in accordance with the control signal;

a voltage to frequency converter coupled to the output of the selector means to convert the selected one of the input analog signals into a train of pulses having a frequency proportional to the value of the selected parameter; and

means, fed by the train of pulses for calculating the value of the selected one of the operating parameters and operator selected processing signals in response to the frequency of the pulse train.

4,578,768

COMPUTER AIDED COORDINATE DIGITIZING SYSTEM

Marsh V. Racine, 4069 Alameda Dr., San Diego, Calif. 92103

Filed Apr. 6, 1984, Ser. No. 597,132

Int. Cl.[4] G01B *17/00*; G06F *15/20*

U.S. Cl. 364—560 **8 Claims**

8. A method of generating an estimate of the cost of construction of a building represented by a plan comprising a series of construction drawings, comprising the steps of:

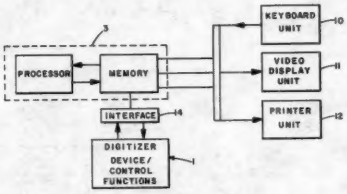
associating a series of pre-selected areas of a flat surface with a series of control functions for operating a computer;

placing a control device having a series of control areas each corresponding to a respective one of the control functions on the flat surface such that each control area coincides with the pre-selected area of the flat surface associated with that control function;

placing a series of construction drawings representing a building plan sequentially on the flat surface;

positioning a pointer device at a series of selected positions on each drawing and at selected positions on said control device;

monitoring the pointer device with a sensing device linked to a computer;



controlling the sensor device to generate a series of X-Y co-ordinate signals corresponding to the positioning of the pointer device on the drawing and to generate control signals in response to the positioning of the pointer device on selected control areas of the control device;

providing the generated series of X-Y co-ordinate signals as data input to the computer; and

controlling the computer in response to program instructions stored in the memory of the computer and control signals received from the control device to utilize the data input from the sensor device to calculate a series of desired parameters and to generate from the calculated parameters an estimate of the cost of construction of a building represented by the construction drawings.

4,578,769

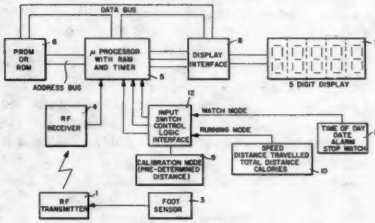
DEVICE FOR DETERMINING THE SPEED, DISTANCE TRAVERSED, ELAPSED TIME AND CALORIES EXPENDED BY A PERSON WHILE RUNNING

Edward C. Frederick, Kingston, N.H., assignor to Nike, Inc., Beaverton, Oreg.

Filed Feb. 9, 1983, Ser. No. 465,274

Int. Cl.[4] G01C *22/00*

U.S. Cl. 364—565 **25 Claims**



1. A device for measuring the speed of a person while running along a surface, said device comprising:

a foot contact sensing means for sensing when a foot of the runner is in contact with the surface and producing a foot contact signal having a duration proportional to the time the foot is in contact with the surface;

transmitting means connected to said foot contact sensing means for transmitting said foot contact signal;

receiving means for receiving said foot contact signal transmitted by said transmitting means;

processing means connected to said receiving means for calculating, solely from said foot contact signal, an output signal representing the speed of the runner; and

display means connected to the output of said processing means for displaying the speed of the runner in accordance with said output speed signal.

4,578,770

METHOD OF DISCRIMINATING SHEET

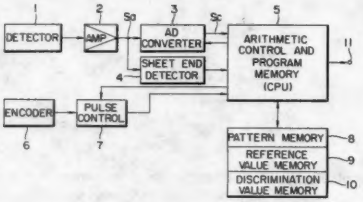
Tsuneyoshi Mitani, Kawasaki, Japan, assignor to Musashi Engineering Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 10, 1983, Ser. No. 502,525

Claims priority, application Japan, Aug. 20, 1982, 57-119212

Int. Cl.[4] G01C *25/00*; G01N *21/88*

U.S. Cl. 364—571 **3 Claims**



1. In a method of dicriminating a sheet comprising passing one-by-one a plurality of sheets of the same type before at least one photodetector, said photodetector producing printing pattern signals or respective sheets thus passed before the photodetector, and determining the defect of the sheet by comparing said printing pattern signals with stored printing pattern signal, wherein the improvement comprises:

generating pulses while each sheet is passing before said photodetector and counting the number of pulses for determining the length of each sheet;

calculating and storing, in a first, reference storage means, a first comparison and discrimination value based on counted pulses and the printing pattern signals produced by said photodetector for one of said sheets;

calculating and storing, in a second storage means, a second comparison and discrimination value based on counted pulses and the printing pattern signals produced by said photodetector for the next succeeding sheet which passes before said photodetector;

comparing said second comparison and discrimination value with said first comparison and discrimination value; and

when the second comparison and discrimination value is normal as determined by comparing said second comparison and discrimination value with said first comparison and discrimination value, erasing the first comparison and discrimination value from said first, reference storage means and transferring said second comparison and discrimination value from said second storage means to said first, reference storage means;

whereby the comparison and discrimination value of a preceding sheet in said first, reference storage means is replaced by the comparison and discrimination value for the next succeeding normal sheet and each succeeding sheet passing before the photodetector is measured for normalcy by the comparison and discrimination value of said preceding sheet.

4,578,771

DYNAMICALLY REPROGRAMMABLE ARRAY LOGIC SYSTEM

Almerin C. O'Hara, Jr., Kingston, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1980, Ser. No. 221,149

Int. Cl.[4] G11C *11/40*

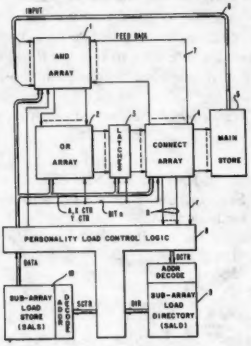
U.S. Cl. 364—716 **7 Claims**

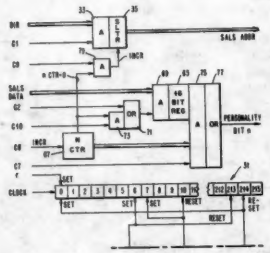
1. In a system including a reprogrammable logic array of the type having an AND array and an OR array for performing a sequence of complex logical functions the improvement comprising;

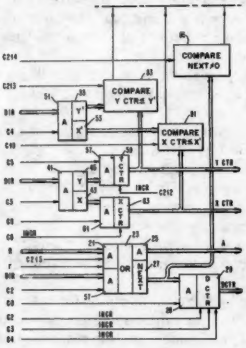
a load store for storing the logic personalities respectively representative of a plurality of functions to be executed by said reprogrammable logic array;

accessing means responsive to a load command for accessing the logic personality of a function stored in said load store;

addressing means for addressing said reprogrammable logic array; and







transfer means connected to said load store and connected to said reprogrammable logic array for reading said accessed logic personality in said load store and writing said accessed logic personality into said reprogrammable logic array;

whereby a reprogrammable logic array which has a first personality for executing a first function is dynamically repersonalized with a second personality for executing a second function so as to enable the reprogrammable logic array to perform a transaction requiring both functions without requiring that the reprogrammable logic array be

large enough to store the personality for all of the functions that it may have to execute.

4,578,772

VOLTAGE DIVIDING CIRCUIT

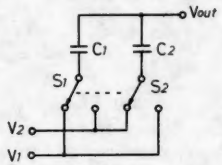
Shigeru Fujii, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 14, 1982, Ser. No. 418,008

Claims priority, application Japan, Sep. 18, 1981, 56-147292; Dec. 29, 1981, 56-213402

Int. Cl.[4] H02M *3/06*

U.S. Cl. 364—850 **11 Claims**



1. A voltage dividing circuit, comprising:

first power source means for providing a first voltage;

second power source means for providing a second voltage;

an output terminal;

a plurality of capacitance elements of substantially the same capacitance each operatively and continuously connected to the output terminal; and

switching means, operatively connected to each of said capacitance elements, individually, and to said first and second power source means, for alternately connecting said capacitance elements to said first power source means and said second power source means using simultaneous connection changes, whereby an output voltage, generated by dividing the first and second voltages into fractions by means of the capacitance elements, is generated at the output terminal as an average of periods during which each of said capacitance elements is connected to one of said first power source means and said second power source means.

4,578,773

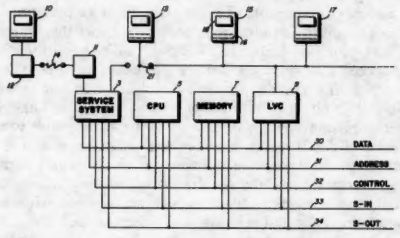
CIRCUIT BOARD STATUS DETECTION SYSTEM

Anil I. Desai, Saratoga, and Eric C. Westerfeld, Milpitas, both of Calif., assignors to Four-Phase Systems, Inc., Cupertino, Calif.

Filed Sep. 27, 1983, Ser. No. 536,914

Int. Cl.[4] G06F *11/26, 11/32*

U.S. Cl. 364—900 **1 Claim**



1. An electronic system comprising:

bus means comprising means for conveying information, including address, data, and control information;

at least one circuit board coupled to said bus means, said circuit board comprising:

electronic circuitry for performing a predetermined function;

means for uniquely identifying said circuit board, said identifying means comprising first and second programmable digital switch means for encoding first and second digital numbers, respectively, said first digital number uniquely identifying the function of said circuitry, and said second digital number uniquely identifying a manufacturing history for said circuit borad;

status signal generating means responsive to said circuitry for generating a status signal in response to the occurrence of at least one predetermined type of condition existing in said circuitry;

status signal storage means responsive to said status signal generating means for storing said status signal; and

reset means coupled to said circuitry for initiating a reset operation of said circuitry; and

a processing unit coupled to said bus means, said processing unit comprising:

means for polling said circuit board, said polling means comprising means for reading said first and second digital numbers and means for determining whether said status signal is stored in said status signal storage means; and

means for generating a command to said reset means, causing a reset operation of said circuitry to be initiated.

4,578,774

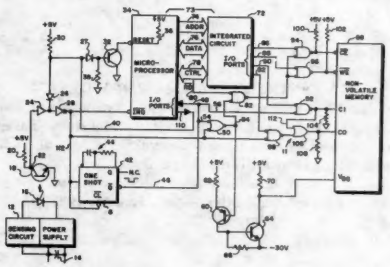
SYSTEM FOR LIMITING ACCESS TO NON-VOLATILE MEMORY IN ELECTRONIC POSTAGE METERS

Arno Muller, Westport, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Jul. 18, 1983, Ser. No. 514,726

Int. Cl.[4] G06F *12/14, 13/12*

U.S. Cl. 364—900 **21 Claims**



21. A system for limiting access to a non-volatile memory (NVM) of an electronic postage meter for an erasing and a writing data therein to predetermined periods of time after a power up cycle and during a power down cycle of the meter the NVM having data therein after the power up cycle and during the power down cycle, the NVM having an enable terminal and a plurality of remaining terminals, comprising:

signal means for providing an output signal in response to a power up voltage condition;

pulse supplying means electrically connected to said signal means for providing an output pulse having a predetermined width in accordance with presence of an output signal from said signal means, said pusle supplying means including a one-shot multivibrator and circuit means electrically coupled to thereto establish the pulse width of the output pulse;

a microcomputer means electrically connected to said pulse

supplying means and said signal means for receiving signals therefrom;

gate means interposed between said microcomputer means and the non-volatile memory for enabling the non-volatile memory upon power up of the electronic postage meter when the output pulse is provided from said pulse supplying means to allow desired data to be erased from the non-volatile memory by said microcomputer and for enabling the non-volatile memory during power down of the electronic postage meter when an output signal is removed from said signal means to allow desired data to be written into the non-volatile memory for a predetermined period of time in accordance with the output signal being provided from said microcomputer;

switching means responding to the output pulse for applying a bias voltage to the NVM for enabling the erasing of the desired data therefrom during the width of the output pulse;

additional gate means interposed between said pulse supplying means and said gate means for activating said gate means in response to the output pulse;

means for biasing the remaining terminals of the NVM during the normal postage meter operation to preclude the writing and erasing of data therein;

interrupt means electrically coupled to said signal means and said microcomputer for supplying an interrupt signal to said microcomputer in response to the power up output signal being removed from said signal means; and

means coupled to said signal means for supplying a signal to activate said additional gate means when the power up output signal is removed from said signal means indicating a beginning of the power down cycle.

4,578,775

MAGNETIC BUBBLE MEMORY DEVICE

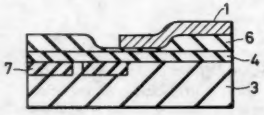
Ryo Suzuki, Kodaira; Yutaka Sugita, Tokorozawa; Teruaki Takeuchi, Kokubunji; Naoki Kodama; Masatoshi Takeshita, both of Hachioji, and Hiroshi Umezaki, Koganei, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 16, 1983, Ser. No. 505,379

Claims priority, application Japan, Jun. 16, 1982, 57-102060

Int. Cl.[4] G11C *19/08*

U.S. Cl. 365—36 **16 Claims**



1. A magnetic bubble memory device characterized in that said device is equipped with a major line or major loop, and with a minor loop of a magnetic bubble propagation track formed by ion implantation over a desired region of a magnetic film capable of retaining magnetic bubbles, at least part of the junction between said major line or said major loop and said minor loop consisting of a soft magnetic material film, and the thickness of an insulating film at said junction is smaller than that of said insulating film at the rest of the device, whereby a drop in the propagation margin at the junction can be prevented.

4,578,776

DYNAMIC SEMICONDUCTOR MEMORY DEVICE

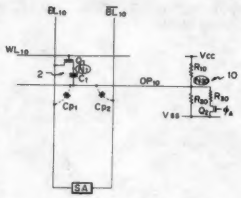
Yoshihiro Takemae, Tokyo; Tomio Nakano, Kawasaki, and Kimiaki Sato, Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 28, 1983, Ser. No. 555,891

Claims priority, application Japan, Dec. 1, 1982, 57-211146

Int. Cl.[4] G11C *11/24*

U.S. Cl. 365—149 **16 Claims**



1. A dynamic semiconductor memory device, operatively connectable to a power supply potential, comprising:

a word line;

a bit line;

a one-transistor one-capacitor type dynamic memory cell, comprising:

a single transistor having a gate electrode operatively connected to said word line, a first electrode operatively connected to said bit line and a second electrode; and

a capacitor having a first electrode operatively connected to the second electrode of said transistor and a second electrode; and

a voltage dividing circuit, operatively connectable to the power supply potential, comprising:

a potential providing terminal, operatively connected to the second electrode of said capacitor, for providing an intermediate potential between the power supply potential and ground; and

a potential switching circuit, operatively connected to said potential providing terminal, for changing the intermediate potential in synchronism with the operation of said dynamic semiconductor memory device.

4,578,777

ONE STEP WRITE CIRCUIT ARRANGEMENT FOR EEPROMS

Sheng Fang, E. Palo Alto, and Kameswara K. Rao, Santa Clara, both of Calif., assignors to Signetics Corporation, Sunnyvale, Calif.

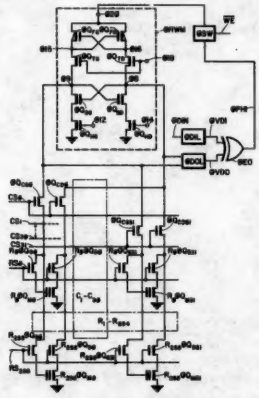
Filed Jul. 11, 1983, Ser. No. 512,858

Int. Cl.[4] G11C *11/34*

U.S. Cl. 365—184 **28 Claims**

1. In a memory system of the EEPROM type which includes a plurality of memory cells arranged in rows and columns, each memory cell capable of storing one bit of a data word and selecting means for simultaneously selecting more than one cell to enable information applied to said system to be written into said selected cells during a writing cycle and to be read from said cells during a reading cycle, said information being stored in said cells in either a first state or a second state, the improvement comprising writing means operating in response to the existence of a difference between the information stored in each selected cell and the information to be stored therein during a writing cycle and simultaneously writing information into only those selected cells for which a difference exists, said writing being executed regardless of whether such difference indicates a change from said first state to said second state or vice versa, said data words comprising bytes memory, each byte being associated with a separate plurality of memory cells and said writing means including a separate writing circuit associated with each cell of a byte, each writing circuit includ-

ing a flip-flop circuit which is in a first state at the start of a writing operation to conduct current in a first direction and write information in said first state into an associated cell and



in a second state at the start of a writing operation to conduct current in a second direction and write information in said second state into an associated cell.

4,578,778

SEMICONDUCTOR MEMORY WITH LOAD CONTROLLING FEEDBACK MEANS TO REDUCE POWER CONSUMPTION

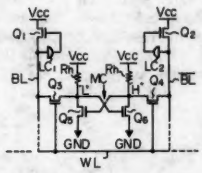
Keizo Aoyama, Yamato, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 1, 1982, Ser. No. 413,752

Claims priority, application Japan, Sep. 1, 1981, 56-136066; Sep. 1, 1981, 56-136067; Sep. 1, 1981, 56-136068

Int. Cl.⁴ G11C *7/00, 11/40*

U.S. Cl. 365—190 **16 Claims**



1. A semiconductor memory circuit comprising:

first and second bit lines each having a high or low level logic state;

a memory cell including a flip-flop circuit, said flip-flop circuit having first and second pull down transistors operatively connected to said first and second bit lines, respectively;

first and second load transistors, operatively connected between a power source and said first and second bit lines, respectively, said first and second load transistors each having a control gate and each having a large g_m state and a small g_m state;

a word line, operatively connected to said memory cell, for accessing said memory cell; and

first and second feedback means, operatively connected between said first and second bit lines and said control gates of said first and second load transistors, respectively, for controlling one of said load transistors connected to said bit line having the lower level, to have the small g_m state, and for controlling the other one of said load transistors connected to said bit line having the higher level, to have the large g_m state.

4,578,779

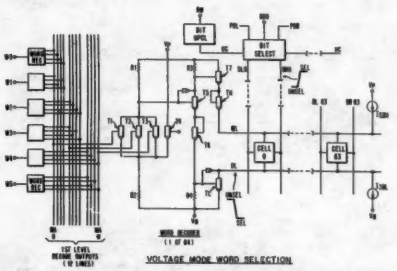
VOLTAGE MODE OPERATION SCHEME FOR BIPOLAR ARRAYS

Yuen H. Chan, and James R. Struk, both of Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 25, 1984, Ser. No. 624,486

Int. Cl.⁴ G11C *7/00*

U.S. Cl. 365—190 **23 Claims**



2. An improved circuit for high-speed word addressing of an m×n array of memory cells, where m and n are positive integers, said array including:

m pairs of bit lines, each pair of bit lines being connected to n discrete ones of said m×n memory cells;

n pairs of word lines each pair of word lines having an upper word line and a lower word line, each pair of word lines being connected to m discrete ones of said m×n memory cells; and,

the improvement comprising n push-pull transistor pairs, each of said n push-pull transistor pairs including an emitter follower transistor whose emitter is coupled to the upper word line, and an open collector transistor whose collector is coupled to the lower word line of a discrete one of said n word line pairs.

4,578,780

DUAL PORT TYPE SEMICONDUCTOR MEMORY

Fumio Baba, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 27, 1983, Ser. No. 536,321

Claims priority, application Japan, Sep. 30, 1982, 57-169551

Int. Cl.⁴ G11C *7/00*

U.S. Cl. 365—190 **9 Claims**

7. A dual port type semiconductor memory including a dynamic random access memory, comprising:

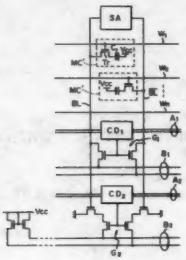
word lines;

pairs of bit lines intersecting said word lines;

dynamic memory cells respectively, operatively connected at the intersections of said word lines and one of the bit lines of each of said pairs of bit lines;

first and second column decoders, respectively, operatively connected to said pairs of bit lines;

a writing-reading out bus operatively connected to said first column decoders; and



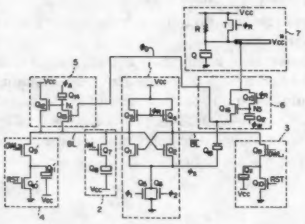
a reading out bus operatively connected to said second column decoders.

4,578,781

MIS TRANSISTOR CIRCUIT

Junji Ogawa, Yokohama; Tomio Nakano; Masao Nakano, both of Kawasaki; Norihisa Tsuge, Kamakura, and Takashi Horii, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 31, 1982, Ser. No. 413,405
Claims priority, application Japan, Aug. 31, 1981, 56-135585
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—203 **15 Claims**



1. An MIS transistor circuit operated alternately in a reset state or in an active state and operatively connected to receive input signals, comprising:

at least one operating node;

at least one input terminal, operatively connected to receive the input signals and operatively connected to said at least one operating node and the MIS transistor circuit, said at least one operating node being charged or discharged during the reset state, and the MIS transistor circuit being operated in response to the input signals applied to said at least one input terminal during the active state;

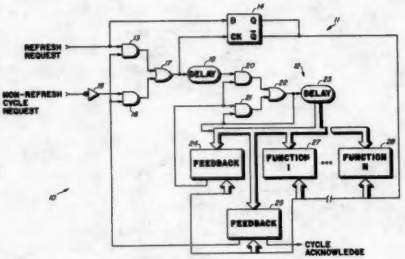
a voltage holding circuit, operatively connected to said at least one operating node, for holding a power supply voltage applied during the reset state to a clamped voltage, said clamped voltage and for applying during the active state as an actual power supply voltage to predetermined nodes of said at least one operating node of the MIS transistor circuit.

4,578,782

ASYNCHRONOUS MEMORY REFRESH ARBITRATION CIRCUIT

Douglas R. Kraft, Austin, and Harry F. Elrod, Ft. Worth, both of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 26, 1983, Ser. No. 526,736
Int. Cl.[4] G11C *7/00*; G06F *9/46*
U.S. Cl. 365—222 **7 Claims**



1. In a memory system having memory cycle generating circuitry for performing predetermined memory cylces, a circuit for asynchronously arbitrating between refreshing memory of the memory system and performing a predetermined non-refresh memory cycle, comprising:

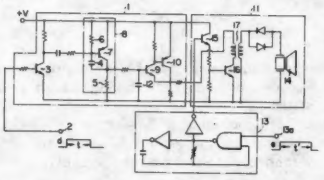
arbitration means for asynchronously receiving either a refresh memory request signal or a non-refresh memory cycle request signal or both request signals during one of a plurality of successive memory cycles, and arbitrating, during a dedicated arbitration time frame of each of the plurality of successive memory cycles and simultaneous with a memory cycle operation, which signal to execute in an immediately successive memory cycle, thereby reducing the length of the immediately successive memory cycle.

4,578,783

ULTRASONIC DISTANCE MEASURING APPARATUS

Hiroshi Iwata, Nara, and Hiroshi Makino, Hirakata, both of Japan, assignors to West Electric Co., Ltd., Osaka, Japan

Filed Apr. 25, 1983, Ser. No. 488,166
Claims priority, application Japan, Apr. 28, 1982, 57-71811
Int. Cl.[4] G01S *7/66*
U.S. Cl. 367—99 **3 Claims**



1. An ultrasonic distance measuring apparatus comprising:

an ultrasonic wave transmission circuit including an ultrasonic transducer, a step-up transformer having a primary coil and a secondary coil for driving said transducer to generate an ultrasonic wave, an oscillator circuit for generating an oscillation signal to set a frequency of the ultrasonic wave, first switch means connected between a power supply terminal and said primary coil for controlling the supply of power from a power supply terminal to said primary coil, said first switch means being switched by the oscillation signal of said oscillator circuit in order

to control a timing of the supply of electric power from said power supply terminal to said primary coil; and

a waveform shaping circuit including second switch means for switching between first and second conditions in response to a control signal which defines a transmission period of the ultrasonic wave, a waveform shaping section for generating an output signal which linearly increases to a predetermined level in response to the first condition of said second switch means and maintains the predetermined level until said second switch means assumes the second condition, and third switch means including a capacitor charged by the output signal of said waveform shaping section and a switching element connected between said power supply terminal and said primary coil and having a controllable electrode supplied with terminal voltage of said capacitor, said third switching means being responsive to the output signal from said waveform shaping section to control the level of the electric power supplied from said power supply terminal to said primary coil so that an ultrasonic wave burst signal having a trapezoidal shape, as determined by said waveform shaping circuit, and a frequency, as determined by said oscillator circuit, is produced by said transducer.

4,578,784

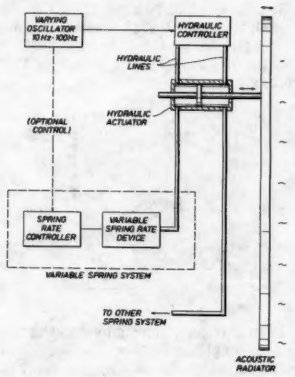
TUNABLE MARINE SEISMIC SOURCE

Joseph F. Mifsud, Houston, Tex., assignor to Exxon Production Research Co., Houston, Tex.

Continuation-in-part of Ser. No. 235,202, Feb. 7, 1981, Pat. No. 4,483,411. This application Nov. 24, 1982, Ser. No. 444,279

Int. Cl.[4] G01V *1/38;* **H04B** *13/00*

U.S. Cl. 367—143 **17 Claims**



1. A marine seismic source comprising:

at lease one acoustic radiator,

a hydraulic actuator for oscillating each said acoustic radiator, each said hydraulic actuator being mechanically connected to its respective acoustic radiator and being adapted to oscillate said radiator so as to produce an acoustic signal having a frequency which varies with time, and

a spring system having a variable spring rate, said spring system being in open hydraulic communication with said hydraulic actuators and having variable spring rate means adapted to vary the effective spring rate of said spring system as a function of frequency, whereby the output impedance of each said acoustic radiator is varied with its frequency.

4,578,785

TWO-COMPONENT ACOUSTIC BOREHOLE TOOL

Valery A. Gelfand, Houston, Tex., assignor to Western Geophyr'cal Company of America, Houston, Tex.

Filed Jun. 6, 1983, Ser. No. 501,614

Int. Cl.[4] G01V *1/40;* **E21B** *47/00*

U.S. Cl. 367—35 **3 Claims**

1. A method of manipulating a borehole tool in a borehole, comprising the steps of:

(a) providing a first module containing signal receiving and control electronics;

(b) nesting a second module in said first module, said second module being light-weight compared to said first module, said second module including a seismic sensor;

(c) Compliantly coupling, electrically and mechanically, said second module to said first module;

(d) Suspending said first module and said second nested module in a borehole at a first operator selected station, by a suspending means;

(e) ejecting said nested second module from said first module;

(f) clamping said sensor against the sidewall of said borehole;

(g) separating said first module from said ejected second module;

(h) locking sad first module to the sidewall of said borehole thereby to acoustically isolate said second module from said first module;

(i) slacking said suspending means; and

(j) repeating steps (f) through (i) at a plurality of operator-selected stations at different depths in said borehole.

4,578,786

TRACK PITCH CALIBRATION SYSTEM FOR USE IN OPTICAL STORAGE DEVICES

Robert McIntosh, Longmont; Harian P. Mathews; David W. Rickert, both of Boulder; Paul Romano, Louisville, and Jerry Walker, Boulder, all of Colo., assignors to Storage Technology Partners II, Louisville, Colo.

Filed Jul. 6, 1984, Ser. No. 628,687

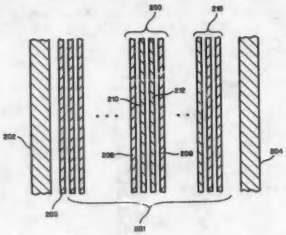
Int. Cl.[4] G11B *7/00*

U.S. Cl. 369—44 **12 Claims**

1. In an optical storage system wherein information is stored by writing data in a data track on a record carrier by directing a write beam to the surface of the record carrier, and wherein the data track being written by the write beam is to be spaced a prescribed distance from a previously written data track that is followed by one or more read beams that are also directed to the surface of the record carrier, a calibration system for positioning the write beam at the prescribed distance from the previously written data track comprising:

means for positioning the write beam a desired distance from the one or more read beams that are following the previously written data trac[illegible] response to an offset signal; and

calibration means for generating said offset signal as a function of the distance between two spaced-apart calibration



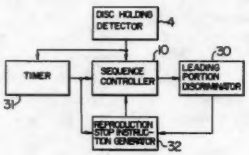
data tracks that have been previously written on the surface of said record carrier.

4,578,787

RECORD DISC REPRODUCING APPARATUS

Keizo Shimizu; Shimpei Otsu, both of Yokohama; Toshio Fujimura; Yoshisada Taniguchi, both of Fujisawa, and Hayashi Nagami, Yamato, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 5, 1982, Ser. No. 432,803
Claims priority, application Japan, Oct. 5, 1981, 56-157501
Int. Cl.[4] G11B *19/10, 17/04, 1/00, 25/04*
U.S. Cl. 369—77.2 5 Claims



1. An apparatus for reproducing information from a record disc, the apparatus having an operational state in which the disc is held without rotation when the disc has been inserted into or has been prepared for withdrawal from the apparatus as well as a reproduction state in which signals recorded on the disc are picked up from the disc when the disc is on a rotating turntable of the apparatus, the apparatus comprising means for measuring the time of the operational state in which the disc is held without rotation, means for comparing the measured time with a predetermined time value, means for producing a first control signal for setting the disc on the turntable when the measured time becomes equal to the predetermined time value, and means for producing a second control signal for rotation of the turntable, thereby suppressing deformation of the disc.

4,578,788

HIGH PERFORMANCE OPTICAL STORAGE MEDIUM WITH SEPARATE MECHANICAL SERVO TRACKS EMBEDDED WITHIN THE MEDIUM

Kie Y. Ahn, Chappaqua; Thomas H. DiStefano, Bronxville, and Victor B. Jipson, Mahopac, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 2, 1983, Ser. No. 500,513
Int. Cl.[4] G11B *7/24*
U.S. Cl. 369—275 14 Claims

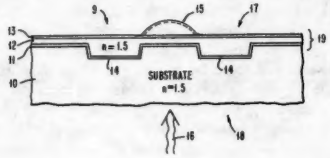
1. An optical storage medium comprising

an optically transparent substrate carrying a thin film structure comprising a data storage material adapted to form deformations representing data formed in said thin film structure of data storage material,

said medium including a servo track formed at an interface between said substrate and said structure,

said servo track comprising internal mechanical undulations of the surface of said interface,

said surface of said interface being coated with a first thin film having a high optical index of refraction and having a thickness on the order of less than or equal to 30 nm,



said mechanical undulations being substantially absent from said surface of said thin film structure in which said deformations are formed,

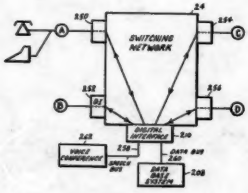
whereby said servo data can be read through said substrate without said servo data substantially affecting the optical image of said deformations on the upper surface of said thin film structure.

4,578,789

SIMULTANEOUS VOICE AND DATA COMMUNICATION AND DATA BASE ACCESS IN A SWITCHING SYSTEM USING A TONE BUS OR BROADCAST MODE

Francisco A. Middleton, Sandy Hook; Nicholas J. R. Carter, and Santanu Das, both of Shelton, all of Conn., assignors to ITT Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 445,625, Nov. 30, 1982, abandoned, Ser. No. 445,626, Nov. 30, 1982, Pat. No. 4,488,287, and Ser. No. 433,335, Oct. 17, 1982, abandoned. This application Mar. 30, 1984, Ser. No. 595,093
Int. Cl.[4] H04Q *11/04;* H04J *3/12*
U.S. Cl. 370—58 10 Claims



1. In a combined telecommunications and data communication system for combining and splitting speech and data for transmission through a digital switching network between two or more ports, said system including, digital interface means coupled to said ports for combining digitally encoded speech and data words from speech and data buses respectively for delivery to said ports in the same channel for bidirectional transmission between said ports, and for splitting speech and data received in the same channel at a port for transmission on speech and data buses, a digital switching network coupled to said digital interface means for switching and transmitting digitally encoded speech and data simultaneously in the same channels between said ports, and a tone bus coupled to said digital interface means for providing data to any port, in combination therewith apparatus for receiving and transmitting data to said ports, comprising:

data base means, coupled to a predetermined port of said switching network to allow transmitted data emanating from any connected port to be received by said data base and for providing at an output a data stream for other ports, said

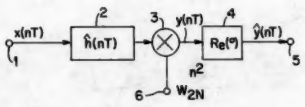
data stream from said data base means coupled to said tone bus for transmission of said data stream to said other ports, whereby data received by said data base and data contained in said data base may be broadcast to the other ports.

4,578,790

SYSTEM AND EQUIPMENT FOR SINGLE SIDE BAND MULTIPLEXING THROUGH DIGITAL PROCESSING

Francesco Molo, Milan; Silvio Cucchi, Gaggiano, and Gianfranco Cariolaro, Feriole Di Teolo, all of Italy, assignors to Telettra-Telefonia Elettronica e Radio S.p.A. Corso Buenos Aires, Milan, Italy

Filed Jun. 9, 1983, Ser. No. 502,710
Int. Cl.[4] H04J 4/00
U.S. Cl. 370—50 9 Claims



1. A system for single sideband frequency muliplexing several input signals which are in the form of a single time multiplexed signal, said system comprising:

a complex time invariant filter for filtering said time multiplexed signal to provide a filtered signal, said filter having an impulse response given by $\hat{h}(nT)=h(nT)W_{2N}^{-n^2}$ wherein W_{2N} is equal to $\exp(j^{2\pi/2N})$, j being the imaginary unit, N an even integer equal to the number of signals to be frequency multiplexed, T the time interval between samples of the time multiplexed signal, n takes all integer values representing discrete time instants and h(nT) is the impulse response of a complex filter with a passband starting from zero frequency and equal to the band assigned to each input signal in the frequency multiplexed signal;

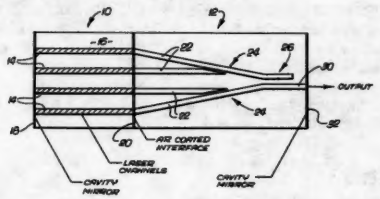
a modulator for modulating said filtered signal with a complex periodic carrier having time samples given by $W_{2N}^{n^2}$, to provide a modulated signal having real and imaginary components, said real component being the desired frequency multiplexed signal.

4,578,791

HIGH-POWER INJECTION LASER DIODE STRUCTURE

Bor-Uei Chen, Los Angeles, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Dec. 20, 1982, Ser. No. 450,831
Int. Cl.[4] H01S 3/05
U.S. Cl. 372—50 3 Claims



1. A semiconductor device comprising:

a semiconductor substrate;

a plurality of semiconductor junction laser diodes having laser cavities formed in a spaced relationship on said substrate;

an optical star coupler having a single output and a plurality of inputs coupled to receive the respective outputs of said laser diodes, said star coupler including a plurality of input waveguides that converge in pairs in a non-parallel fashion at coupling regions, a plurality of intermediate waveguides extending from coupling regions, and at least one additional coupling region to combine the intermediate waveguides into a single output waveguide;

wherein said optical star coupler serves both to combine the outputs of said laser diodes and to couple said laser cavities together for improved coherence and divergence properties, providing a single output with a near-circular cross section and a practically planar wavefront;

and wherein

said laser cavities are mirrored at one end only and said star coupler is mirrored at its output end to provide an integrated laser chamber including said laser cavities and said star coupler, and

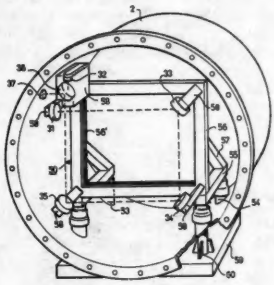
the path lengths measured from the mirrored end of each laser cavity to the mirrored end of the star coupler output, are approximately the same.

4,578,792

HIGH-POWER LASERS

Ethan D. Hoag, East Boston, Mass., assignor to Metalworking Lasers International Ltd., Neve Sharett, Israel

Filed Sep. 30, 1982, Ser. No. 431,014
Int. Cl.[4] H01S 3/22
U.S. Cl. 372—58 20 Claims



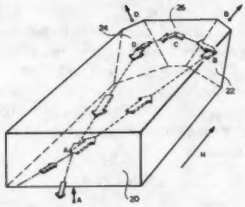
1. A high-power flowing-gas laser comprising: an outer housing having a sealed wall capable of withstanding an internal pressure different from atmosphere; a housing mounting for mounting the housing to a support; an optical system including a laser channel within said housing; an impeller within said housing for producing a flow of gas through said laser channel; and a motor drive for driving said impeller; characterized in that said laser further includes an independent mounting for mounting said optical system to said support independently of said housing mounting such as to isolate the optical system from the vibrational disturbances of said impeller and said motor drive; said independent mounting for the optical system including a plurality of legs each including a sealed lead-through leading the respective leg through the housing wall; said sealed lead-through for each leg comprising an elastomeric boot between the respective leg and said housing wall, the outer face of each boot being disposed within the interior of said housing and the latter being subject to a sub-atmospheric pressure, the inner face of each boot being disposed exteriorly of said housing and being subject to atmospheric pressure thereby preventing the boot from buckling.

4,578,793

SOLID-STATE NON-PLANAR INTERNALLY REFLECTING RING LASER

Thomas J. Kane, Redwood City, and Robert L. Byer, Stanford, both of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Jul. 13, 1984, Ser. No. 630,772
Int. Cl.[4] H01S *3/083*
U.S. Cl. 372—94 **28 Claims**



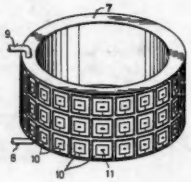
1. A non-planar laser resonator, comprising a single piece of solid-state laser material, reflecting means internal to said laser materials for defining a non-planar ray path in said resonator, at least two reflections taking place at internal surfaces of said piece of solid-state laser material said surfaces being oriented to change the plane of incidence of the propagating ray to produce said non-planar ray path.

4,578,794

METALLURGICAL VESSEL

Walter Cadek, Graz, Austria, assignor to Vereinigte Edestahlwerke Aktiengesellschaft (VEW), Vienna, Austria

Filed May 14, 1984, Ser. No. 610,120
Claims priority, application Austria, Jun. 1, 1983, 2004/83
Int. Cl.[4] H05B *3/60*; F27D *3/00, 9/00*
U.S. Cl. 373—42 **34 Claims**



1. A metallurgical vessel for high-melting alloys, expecially alloys formed on the basis of nickel, steel or the like, comprising:

a continuous wall;

a bottom plate cooperating with said continuous wall;

means for supplying electric current to the vessel formed by said continuous wall and said bottom plate;

said continuous wall and said bottom plate holding molten metal for at least partial solidification under the action of said electric current;

a plurality of solenoids for generating a predetermined electromagnetic field to cause movement of the molten material during solidifcation thereof and to compensate for magnetic fields which extend transverse to the longitudinal axis of the metallurgical vessel and arranged about the vessel formed by said continuous wall and said bottom plate;

an electric power supply operatively associated with said plurality of solenoids in order to supply electric power to each one thereof independently of the others;

a plurality of magnetic measuring sensors arranged about the vessel formed by said continuous wall and said bottom plate; and

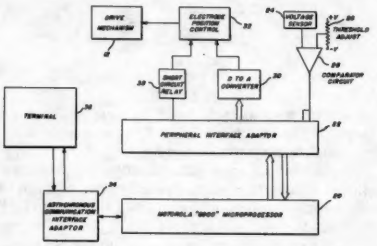
said magnetic measuring sensors controlling said electric power supply in order to generate said predetermined electromagnetic field by means of said plurality of solenoids.

4,578,795

DROP SHORT CONTROL OF ELECTRODE GAP

Robert W. Fisher; James P. Maroone; Donald W. Tipping, all of Albuquerque, and Frank J. Zanner, Sandia Park, all of N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 28, 1982, Ser. No. 453,977
Int. Cl.[4] H05B *7/148*
U.S. Cl. 373—70 **8 Claims**



1. A process of controlling the position of a consumable electrode in a consumable electrode furnace having an arc struck between said consumable electrode and a molten pool of material, said process comprising:

monitoring the voltage across said arc to produce a monitored voltage signal;

detecting the occurrence of drop shorts by comparing said monitored voltage signal to a drop short detection threshold signal and producing a drop short signal;

determining the average period between drop shorts from said drop short signal;

determining the actual electrode gap by non-invasive means using said average period and a drop short period electrode gap model slope and intercept;

comparing said actual electrode gap with a desired electrode gap value and controlling the position of said consumable electrode based upon said comparison.

4,578,796

PROGRAMMABLE MULTIPLE TYPE DATA SET

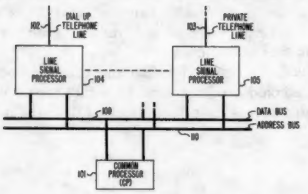
Salomi T. Charalambous; Mark P. Horvath, both of Lincroft, N.J.; Cathy P. House, Alden, N.Y.; Jeffrey A. Iapicco, Lincroft, N.J.; Paul D. Jue, Freehold, N.J., and Shiv P. Verma, Cedar Knoll, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill and AT&T Information Systems Inc., Holmdel, both of, N.J.

Filed Nov. 3, 1983, Ser. No. 548,340
Int. Cl.[4] H04B *1/38*; H04L *5/16, 27/10, 27/18*
U.S. Cl. 375—8 **9 Claims**

1. A data modem comprising:

signal processing means responsive to selected ones of a plurality of sets of instructions and to signals applied to said signal processing means for executing corresponding ones of a plurality of signal converting algorithms appropriate for alternative ones of data modem types to process said applied signals, digital processing means responsive to an external signal source designating individual ones of the data modem types for executing various ones of a plurality of communication line control algorithms, and

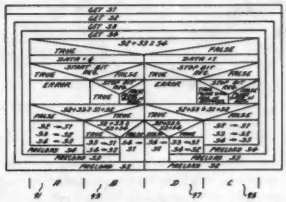
means responsive to the execution of the communication line control algorithms for selecting the instruction sets corresponding to the signal converting algorithms appropriate for the designated data modem types.



4,578,798
METHOD FOR COMMUNICATING BINARY DATA USING MODIFIED FREQUENCY SHIFT KEYING TECHNIQUES

August A. Divjak, Jr., Waukesha, and Thomas C. Holdorf, Milwaukee, both of Wis., assignors to Johnson Service Company, Milwaukee, Wis.

Filed Mar. 15, 1984, Ser. No. 589,764
Int. Cl.[4] H04L *27/10*; H03C *3/00*
U.S. Cl. 375—45 2 Claims



1. A method for communicating binary data using modified frequency shift keying techniques and including the steps of:

selecting a first bit count representative of a first untranslated frequency denoting a data signal at a first logic state;

selecting a second bit count representative of a second untranslated frequency denoting a data signal at a second logic state;

computing a means bit count intermediate said first bit count and said second bit count;

detecting a signal having a first component at a first translated frequency and a second component at a second translated frequency and defining a first interval of time having boundaries identifiable as **T0** and **T1**, a second interval of time having boundaries identifiable as **T1** and **T2**, a third interval of time having boundaries identifiable as **T2** and **T3** and a fourth interval of time having boundaries identifiable as **T3** and **T4**;

generating a base bit count representative of the sum of said second and third time intervals;

decoding said first component as a data signal at said first logic state if said base bit count is equal to or greater than said mean bit count;

decoding said first component as a data signal at said second logic state if said base bit count is less than said mean bit count;

generating a fore bit count representative of the sum of said first and second time intervals;

generating an aft bit count representative of the sum of said third and fourth time intervals;

comparing said base bit count with said fore bit count;

selecting a bit clock initiation time as that time identifiable as **T1** if said base bit count is equal to or less than said fore bit count;

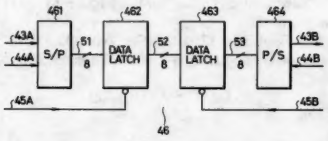
comparing said base bit count with said aft bit count if said base bit count is greater than said fore bit count, and;

selecting said bit clock initiation time as that time identifiable as **T2** if said base bit count is equal to or greater than said aft bit count.

4,578,797
ASYNCHRONOUS CONNECTING DEVICE

Takane Satoh, and Yoichi Tan, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jul. 14, 1983, Ser. No. 513,584
Claims priority, application Japan, Jul. 14, 1982, 57-121228
Int. Cl.[4] H04B *14/04*
U.S. Cl. 375—25 8 Claims



1. In a communications system of the type wherein a digital signal is transmitted along a first path with a first clock rate and along a second path with a second clock rate asynchronous with said first clock rate, an asynchronous connecting device for coupling said digital signal between said first and second paths, said connecting device comprising:

first sampling means for receiving said digital signal from said first path and sampling said digital signal at a first sampling rate synchronized with said first clock rate; wherein said first sampling means comprises a serial-to-parallel converter for receiving said digital signal from said first path and converting said digital signal into word units, and a first latch circuit for receiving and latching said word units in response to a clock signal at said first sampling rate; and

second sampling means for receiving the output of said first sampling means and sampling said output at a second sampling rate synchronized with said second clock rate; wherein said second sampling means comprises a second latch circuit for receiving and latching the output of said first latch circuit in response to a second sampling signal at said second sampling rate, and a parallel-to-serial converter for converting the output of said second latch circuit into a serial digital signal having said second clock rate.

4,578,799

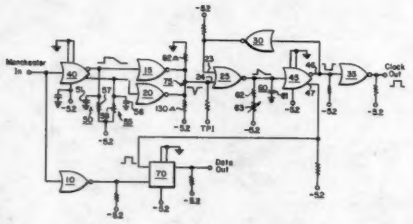
METHOD AND APPARATUS FOR RECOVERING DATA AND CLOCK INFORMATION FROM A SELF-CLOCKING DATA STREAM

Frederick W. Scholl, Riverdale, and Michael H. Coden, New York, both of N.Y., assignors to Codenoll Technology Corporation, Yonkers, N.Y.

Filed Oct. 5, 1983, Ser. No. 539,128

Int. Cl.[4] H03D *3/22*; H04L *27/22*, *7/02*; G11B *5/09*

U.S. Cl. 375—87 **22 Claims**



1. In a data transmission system using self-clocking bi-phase coded bit streams, said bit streams having a predetermined bit period and two voltage levels with negative-going and positive-going voltage level transitions occurring in the stream to indicate clock information and data information, at least a first such voltage level transition and possibly a second voltage level transition occurring in each bit period, apparatus for recovering said information comprising:

means for generating from each voltage level transition in the coded bit stream, a pulse having a first polarity,

a non-retriggerable one-shot to which is applied the pulse of first polarity, said one-shot producing an output pulse having a duration that is approximately the time interval between said first and second voltage transitions and being non-retriggerable after said pulse terminates for a period of time less than the difference between the duration of a bit period and the duration of said output pulse, said output pulse providing clock information derived from the coded bit stream, and

bistable storage means having a clock input to which clock information from an output of the one-shot is applied and a data input to which the coded bit stream is applied, said clock information being delayed by less than said time interval relative to any delay experienced by the coded bit stream, said bistable storage means providing at an output thereof data information decoded from the coded bit stream.

4,578,800

SYNCHRONIZATION CIRCUIT FOR A VITERBI DECODER

Yutaka Yasuda, 7-50-40, Higashi-ohizumi, Nerima-ku, Tokyo; Yasuo Hirata, 13-39, Mure 5-chome, Mitaka-shi, Tokyo; Shuji Murakami, c/o NEC Corporation, 33-1, Shiba 5-chome, Minato-ku, Tokyo; Katsuhiro Nakamura, c/o NEC Corporation, 33-1, Shiba 5-chome, Minato-ku, Tokyo, and Yukitsuna Furuya, c/o NEC Corporation, 33-1, Shiba 5-chome, Minato-ku, Tokyo, all of Japan

Filed Jul. 6, 1983, Ser. No. 511,503

Claims priority, application Japan, Jul. 12, 1982, 57-120941; Jul. 12, 1982, 57-120942

Int. Cl.[4] H04L *7/04*

U.S. Cl. 375—106 **7 Claims**

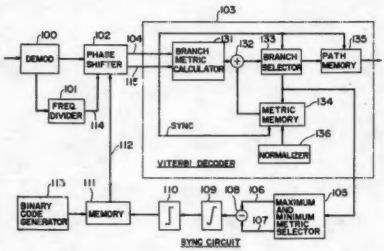
1. A synchronization circuit for a Viterbi decoder adapted to receive bit stream of code words and having means for deriving a word synchronization signal from said bit stream, said Viterbi decoder having a trellis diagram representing a series of a plurality of metric branches, said circuit comprising:

a phase shifter responsive to the receipt of said bit stream and said word synchronization signal for introducing a delay time to one of said bit stream and said word synchronization signal in response to a control signal applied thereto;

first detecting means for detecting a maximum metric value and a minimum metric value of said Viterbi decoder which have occurred in said trellis diagram over a series of said metric branches;

second detecting means for detecting the difference between said detected maximum and minimum metric values;

integrating means for integrating said detected difference;



third detecting means for detecting when the output signal of said integrating means reaches a value indicative of one of word-in-sync and word-out-of-sync conditions of said Viterbi decoder; and

means for generating a phase shift signal in response to an output signal from said third detecting means and for applying said phase shift signal to said phase shifter as said control signal.

4,578,801

RADIOGRAPHY

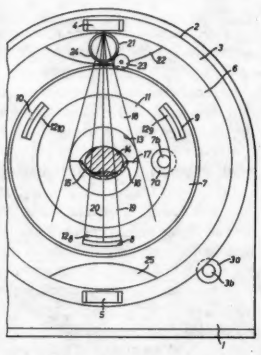
Colin C. Oliver, Slough, England, assignor to EMI Limited, Hayes, England

Filed Sep. 12, 1977, Ser. No. 832,378

Claims priority, application United Kingdom, Sep. 23, 1976, 39461/76

Int. Cl.[4] A61B *6/00*

U.S. Cl. 378—19 **12 Claims**



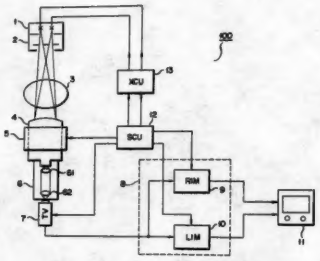
1. A method of scanning an area of interest within a transverse body plane comprising the steps of: continuously rotating a source of penetrating radiation and a radiation detector array in opposing directions about said area of interest to provide a series of parallel radiation beam paths from said source to said detector array over a plurality of angular positions through said area.

4,578,802

X-RAY DIAGNOSTIC APPARATUS FOR ALLOWING STEREOSCOPIC VISUALIZATION ON X-RAY IMAGES OF AN OBJECT UNDER EXAMINATION

Katsutoshi Itoh, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Japan

Filed Jun. 22, 1984, Ser. No. 623,506
Claims priority, application Japan, Jun. 27, 1983, 58-115388
Int. Cl.[4] A61B 6/02
U.S. Cl. 378—41 11 Claims



1. An X-ray diagnostic apparatus for allowing stereoscopic visualization on X-ray images of an object under examination, comprising:

means for irradiating and projecting intermittently X-rays toward the object at two different projection angles in relation to the object, thereby intermittently producing at least first snd second X-ray transmission images;

first conversion means for converting the first and second X-ray transmission images into first and second electron images and finally into first and second visual images in synchronism with the X-ray projections, and for deviating center positions of the first and second visual images at its output focal plane by deflecting the first and second electron images;

second conversion means having at least first and second conversion regions and converting the first and second visual images intermittently incident upon the first and second conversion regions respectively into first and second video signals; and,

means for controlling the X-ray irradiating and projecting means, the first conversion means and the second conversion means in such a manner that the first and second X-ray transmission images are alternately produced, converted and deviated at the output focal plane, and when the first visual image is incident upon the first conversion region, electrical scanning of the first conversion region is blanked out for an optical storage of the first visual image therein, and also electrical scanning of the second conversion region, upon which the second visual image has been previously incident, is performed.

4,578,803

ENERGY-SELECTIVE X-RAY RECORDING AND READOUT SYSTEM

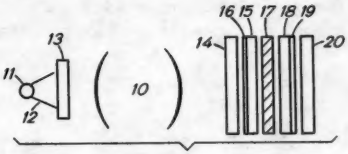
Albert Macovski, 2505 Alpine Rd., Menlo Park, Calif. 94025

Continuation of Ser. No. 327,770, Dec. 7, 1981, abandoned. This application Mar. 16, 1984, Ser. No. 590,533
Int. Cl.[4] A61B 6/00; G01N 23/04
U.S. Cl. 378—62 4 Claims

1. In a method for acquiring x-ray image data at two energy spectra the steps of:

exciting a first scintillating screen directly with an x-ray beam having an energy less than 150 kev that has been projected through a body and coupling the light scintillations to a first photographic emulsion;

filtering the x-ray beam after passing through the first scintillating screen to selectively attenuate a first region of the x-ray spectrum and to permit transmission of a second region of the x-ray spectrum; and



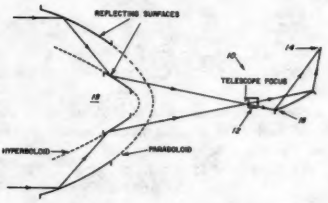
exciting a second scintillating screen directly with the filtered x-ray beam and coupling the light scintillations to a second photographic emulsion.

4,578,804

POLYNOMIAL GRATING

John F. Meekins, Springfield, and Herbert Gursky, McLean, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 30, 1984, Ser. No. 615,504
Int. Cl.[4] G21K 1/06
U.S. Cl. 378—84 4 Claims



4. A spectrometer comprising;

an entrance means for allowing radiation to be analyzed to pass therethrough a diffracting grating means that is fixed relative to the entrance means and which resolves at a power greater than 10^3 all the wavelengths in the wavelength range between λ_1 and λ_2, where λ_1 is 40 A and λ_2 is 340 A, and are the lowest and highest wavelengths in the range to be analyzed, and a detector array means for detecting the component wavelengths of the defracted radiation, the diffracting grating located so that radiation passing through the entrance means is diffracted by the diffraction grating onto the detector array means.

4,578,805

TRANSMISSION LINE TRANSMITTING ENERGY TO LOAD IN VACUUM CHAMBER

Jay S. Pearlman, San Diego, and John P. Shannon, Escondido, both of Calif., assignors to Maxwell Laboratories, Inc., San Diego, Calif.

Filed Oct. 10, 1984, Ser. No. 659,355
Int. Cl.[4] H01J 7/24
U.S. Cl. 378—119 15 Claims

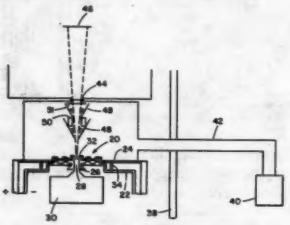
1. A transmission line connecting a power supply, for supplying power pulses, to a load disposed inside of a vacuum chamber, electrically conductive debris in both gaseous and non-gaseous forms being generated in response to application of a power pulse to said load, said transmission line comprising:

a first conductor electrically connecting one side of said load and one side of said power supply;

a second conductor disposed adjacent to, but spaced from, said first conductor and electrically connecting the other side of the load and the other side of said power supply;

an insulator extending between said conductors and partially defining said vacuum chamber;

means disposed between said load and said insulator for receiving debris in non-gaseous form; and



means disposed between said load and said insulator for ejecting debris in gaseous form from between said conductors whereby substantial debris is prevented from accumulating on said insulator which could result in the flashover thereof.

4,578,806

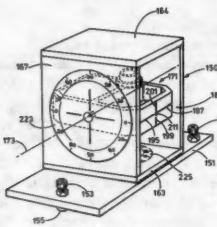
DEVICE FOR ALIGNING COOPERATING X-RAY SYSTEMS

Joseph J. Grass, Brookfield; Marvin P. Glyzewski, and Emanuel V. Polizzi, both of Waukesha, all of Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 15, 1983, Ser. No. 561,941

Int. Cl.[4] A61B *6/08*

U.S. Cl. 378—162 **20 Claims**



1. A device for determining the location of the isocenter of an X-ray system comprising an X-ray source and an X-ray image receptor toward which the X-ray beam from the source is directed, and means supporting said source and receptor for making X-ray views at various angular aspects of a body supported on an X-ray transmissive table, the isocenter being defined as the point of intersection of the rotational axes of the supporting means and the central ray of the X-ray beam, said device comprising:

a base plate,

an X-ray permeable target mounted on said base plate and having side walls arranged in parallelism with each other, and crosshairs comprising a vertical X-ray impermeable line and an intersecting horizontal X-ray impermeable line inscribed on each side wall, the vertical lines lying in common vertical plane and the horizontal lines lying in a common horizontal plane, and

a small X-ray impermeable ball secured in said target on a line extending between the nominal intersections of the crosshairs on each side wall.

4,578,807

FM STEREO MULTIPLEX DEMODULATOR

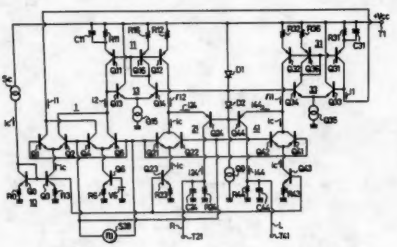
Taiwa Okanobu, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jun. 7, 1984, Ser. No. 618,218

Claims priority, application Japan, Jun. 8, 1983, 58-102344

Int. Cl.[4] H04H *5/00*

U.S. Cl. 381—7 **18 Claims**



1. Apparatus for demodulating an FM stereo multiplex signal, comprising:

a signal generator producing a switching signal having a frequency related to a carrier frequency of said FM stereo multiplex signals;

a double-balanced switching circuit connected to receive said switching signal from said signal generator;

a first current mirror circuit receiving said FM stereo multiplex signal for providing therefrom an output current signal fed to said switching circuit, whereby said switching circuit produces first and second corresponding output current signals;

second and third current mirror circuits connected respectively to receive said first and second output current signals from said switching circuit and each producing a respective output current signal therefrom;

first signal combining circuit for producing a current output signal corresponding to a difference between said output current signal from said second current mirror circuit and said output current signal from said first current mirror circuit; and

second signal combining circuit for producing a current output signal corresponding to a difference between said output current signal from said third current mirror circuit and said output current signal from said first current mirror circuit.

4,578,808

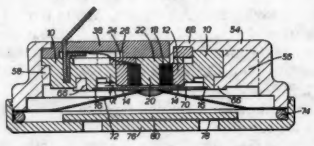
ELECTRO-ACOUSTIC TRANSDUCERS

Leslie L. West, Stapleford, England, assignor to Plessey Overseas Limited, Ilford, England

Filed Jan. 12, 1983, Ser. No. 457,358

Int. Cl.[4] H04R *11/00*

U.S. Cl. 381—88 **7 Claims**



1. An electro-acoustic transducer comprising a first moulded plastics housing, an annular magnet, said annular magnet being moulded in said first housing, said first housing including locat-

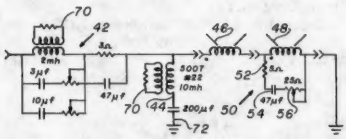
ing means for an annular coil, a stemmed pole piece as a core, an armature and transducer terminals, said coil having electrical connections to said transducer terminals, a plastics cover member abutting said first housing for holding said core and said coil in position and for covering said electrical connections between said coil and said terminals, and a second moulded plastics housing moulded around said first housing, said second housing moulded to and bonding said cover member, said core and said coil in position in said first housing, said second housing partially surrounding said first housing and forming the outer walls of said transducer.

4,578,809

DIHEDRAL LOUDSPEAKERS WITH VARIABLE DISPERSION CIRCUITS

Steven J. Eberbach, 950 Fountain, Ann Arbor, Mich. 48104

Filed Jan. 10, 1983, Ser. No. 457,035
Int. Cl.[4] H03G 5/00
U.S. Cl. 381—99 **7 Claims**



1. A loudspeaker comprising two coaxial driver combinations, each including a high frequency driver and a lower frequency driver, the two coaxial driver combinations located at a dihedral angle relative to each other to direct sound energy away from each other, and the two coaxial driver combinations being substantially the interaural distance apart,

a first crossover circuit connected to the pair of high frequency drivers and a second crossover circuit connected to the pair of lower frequency drivers, means to control the amplitude of one high frequency driver relative to the other high frequency driver and means to control the amplitude of one lower frequency driver relative to the other lower frequency driver,

wherein the lower frequency drivers are in series with each other and with the lower frequency crossover circut, said means to control the amplitude of one lower frequency driver comprising a capacitive shunt and variable resistance means in the shunt, said shunt across said one lower frequency driver,

and wherein the high frequency drivers are electrically in parallel with each other, the means to control the amplitude of one high frequency driver comprising variable resistance means in series with said one high frequency driver.

4,578,810

SYSTEM FOR PRINTED CIRCUIT BOARD DEFECT DETECTION

James W. MacFarlane, Chelmsford, and Bruce E. Smyth, Waltham, both of Mass., assignors to Itek Corporation, Lexington, Mass.

Filed Aug. 8, 1983, Ser. No. 521,423
Int. Cl.[4] G06K 9/00
U.S. Cl. 382—8 **24 Claims**

1. Apparatus for determining defects in patterned images of lines and spaces of predetermined line width and spacing sizes comprising:

(a) an array of detectors for forming pixels consisting of a plurality of electronic bit signals corresponding to the image viewed by said detectors;

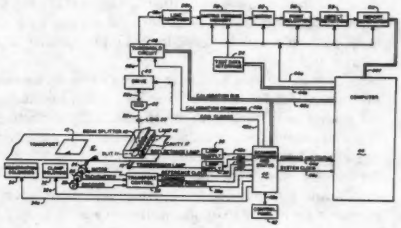
(b) memory apparatus for receiving said pixels sequentially by pixel and by line of said array and forming said pixels in a bit matrix of points in proper image orientation, all of such points being available for sampling;

(c) point selection means for sampling certain of the points of said bit matrix to form a set of defect detection points which set of points depends upon which defect is being detected;

(d) logic means for applying logical conditions to said defect detection points based on localized predetermined pattern rules to determine if defects in said patterned images are present;

(e) size selection means for selecting different sizes for the set of defect detection points for sampling depending on the predetermined line width or spacing sizes of the patterned image;

(f) indicating means for indicating the presence of such defects;



(g) said selection means including means for

(i) sampling "M" number of points of said bit matrix to form a first ring shaped pattern, the diameter D of which corresponds to the size of the minimum line width;

(ii) and sampling "L" number of bit matrix points to form a second ring shaped pattern concentric to said first ring shaped pattern;

(h) enable means for determining the number of said points on said inner ring in a first logic state indicating viewing of a line; and

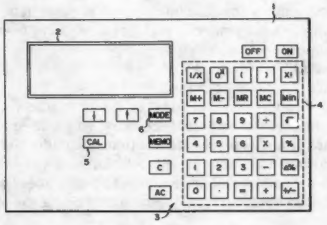
(i) defect detection means for determining the number of consecutive points on said outer ring that are in an opposite logic state to said first logic state.

4,578,811

KEY-IN DEVICE

Naoki Inagaki, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Sep. 14, 1983, Ser. No. 532,501
Claims priority, application Japan, Sep. 21, 1982, 57-164259
Int. Cl.[4] G06K 9/00
U.S. Cl. 382—11 **14 Claims**



1. A key-in device, comprising:

a key-in section including a matrix array of operation keys;

input pattern memory means, coupled to said key-in section, for storing an input pattern corresponding to at least one character by receiving coordinate data corresponding to individual operation keys of said key-in section, when the one character is input by a manual stroking operation on said key-in section, and for sequentially storing the coordinate data in such a manner as to divide the input character into its respective strokes;

standard pattern memory means for storing, as a standard pattern, character data of a character to be recognized, first feature data associated with the direction of each stroke of the respective character and second feature data relating to positions of the starting and ending points of each stroke of the respective character;

means coupled to said input pattern memory means, which forms the first feature data associated with the direction of each stroke of the input character and the second feature data relating to positions of the starting and ending points of each stroke of said input character on the basis of the input pattern which is stored in said input pattern memory means; and

means, coupled to said standard pattern memory means and said means for forming the first and second feature data, for recognizing the keyed-in character by detecting the first and second feature data in said standard pattern memory which coincides with the first and second feature data formed by said first and second feature data forming means, and for selecting the corresponding character data stored in said standard pattern memory means.

4,578,812

DIGITAL IMAGE PROCESSING BY HARDWARE USING CUBIC CONVOLUTION INTERPOLATION

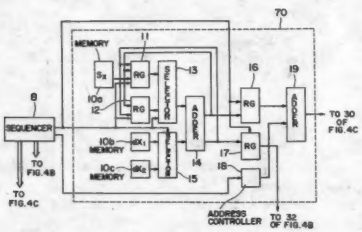
Yoshio Yui, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Nov. 30, 1983, Ser. No. 556,707

Claims priority, application Japan, Dec. 1, 1982, 57-210967; Dec. 1, 1982, 57-210968; Dec. 1, 1982, 57-210969; Dec. 1, 1982, 57-210970

Int. Cl.[4] G06K *9/00*

U.S. Cl. 382—41 **10 Claims**



1. A digital image processing apparatus comprising:

a first memory for containing original pixel data;

a controller for controlling the data read out from said first memory;

a first address controller;

a second address conroller;

first, second, third and fourth line memories operatively connected to said first memory for receiving adjacent lines of image pixel data at a first rate under the control of said first address controller and for reading out said image pixel data at a second rate under the control of said second address controller, said second rate being lower than said first rate;

first, second, third and fourth registers operatively connected with said first, second, third and fourth line memories respectively for receiving the data read out from said line memories;

a weight factor memory which is operatively connected to said second address controller;

first, second, third and fourth groups of multipliers operatively connected to said first, second, third and fourth registers respectively, said first, second, third and fourth groups of multipliers being individually connected with said weight factor memory for receiving weight factors therefrom under the control of said second address controller;

an adder which receives and sums the outputs of said multipliers; and

a third memory for receiving and storing the data derived by said adder.

4,578,813

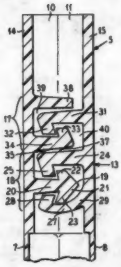
BAG AND RECLOSABLE SEPARABLE FASTENER ASSEMBLY PROVIDING BOTH CLOSING ALIGNMENT FACILITY AND DIFFERENTIAL SEPARATION RESISTANCE

Steven Ausnit, New York, N.Y., assignor to Minigrip Incorporated, Orangeburg, N.Y.

Filed Jun. 11, 1984, Ser. No. 619,187

Int. Cl.[4] B65D *33/16*

U.S. Cl. 383—65 **16 Claims**



1. For a reclosable bag having a pouch body including opposite wall panels with inside surfaces facing toward each other and extending between a bottom edge, opposite sides and an openable top, a reclosably separable fastener assembly adapted to be attached to said surface at the upper portions of said wall panels and associated with upwardly extending pull flanges for separating said fastener assembly to gain downward access to the inside of the bag, said fastener assembly comprising two complementary interengaging sets of spaced parallel, rib-like resiliently flexible extruded plastic separable fastener profile elements providing with interlockable hooks arranged to extend across said wall panels at said inside surfaces and between said side edges, and with a first set on one of said wall panels and a second set on the other wall panel; each of said sets of fastener profile elements having a plurality of said rib like profile elements and a plurality of complementary intervening grooves for receiving the rib like profile elements of the other set in separably interlocking relation, and said profile elements of each set being especially cooperatively related to the other set for mutually facilitating alignment and interlocking closure interengagement by closing pressure applied from outside of the bag wall panels toward said fastener assembly; lower cooperative portions of said sets of fastener profile elements having means for strong resistance to opening from the inside of the bag and upper cooperative portions of said sets of fastener profile elements being arranged for relatively easier opening from the top of the bag by separating manipulation of pull flanges extending thereabove; said first set of fastener profile elements including a first monohook profile element having thereon an interlockable hook directed generally upwardly and having a back surface facing downwardly, said second set

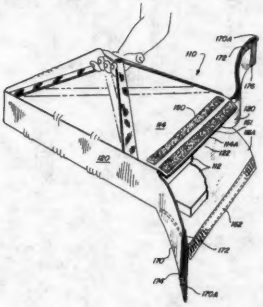
of fastener profile elements including a second monohook profile element having thereon an interlockable look directed generally downwardly and having a back surface facing upwardly and located in back-to-back facing relation to said back surface of said first monohook element, said first set of profile elements including a male profile element of generally arrow shape cross-section located in downwardly spaced relation from said first monohook profile element and having an upwardly directed hook on an upper side and a downwardly directed hook on a lower side, said second monohook profile element adapted for interhooking engagement of the hook thereon with said upwardly directed hook of said male profile element, said second set of profile elements including a monohook profile element below said male profile element and having a hook directed generally upwardly and interlockingly engageable with said downwardly directed hook of said male profile element, and said second set of profile elements having another monohook profile element above said second monohook profile element and with a downwardly directed hook interlockingly engageable with said hook of said first monohook profile element.

4,578,814

THERMALLY INSULATED FOOD BAG

Ingrid Skamser, Hoffman Estates, Ill., assignor to Thermal Bags by Ingrid, Inc., Hoffman Estates, Ill.

Filed Feb. 1, 1984, Ser. No. 575,808
Int. Cl.[4] B65D *33/02, 33/14, 33/24, 81/38*
U.S. Cl. 383—99 **5 Claims**



1. A thermally insulated carrier adapted for use in a horizontal attitude, comprising:

panel means formed of thermally insulating flexible sheet material arranged to form a bag having at least a top panel and a bottom panel, and defining a side opening to facilitate horizontal insertion of containers of warm material into said bag;

a main flap formed of thermally insulating flexible sheet material, a proximal portion of which is hingedly connected to said bottom panel along a bottom edge of said side opening;

first fastening means upon a distal portion of said main flap and second fastening means near the top edge of said side opening for cooperating with said first fastening means to secure said main flap in place over said side opening;

two side flaps formed of said thermally insulating flexible sheet material, proximal portions of which are hingedly connected to said panel means along respective side edges of said side opening for folding over said side opening;

a top flap hingedly connected to said top panel at the top of said side opening and adapted to be folded over said side opening;

fastening means on an outer surface of said top flap for securing said top flap to said side flaps when said side flaps are folded over said top flap;

said side flaps being arranged to overlap each other when folded over said side opening;

and additional fastening means to secure said side flaps to each other when folded over said side opening in overlapping relationship to each other;

each of said side flaps having fastening means upon an inner surface thereof which is adapted to cooperate with, and positioned to engage, said fastening means upon said outer surface of said top flap;

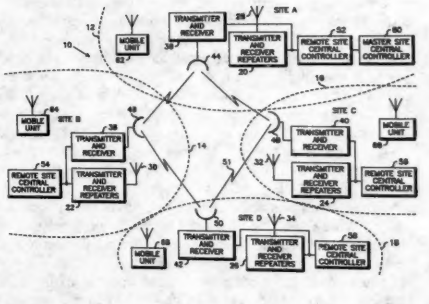
and each of said side flaps having further fastening means upon an outer surface of a distal portion thereof, and further fastening means upon an inner surface of said distal portion thereof which is adapted to cooperate with, and positioned to engage, said further fastening means upon said outer surface of said distal portion of the other side flap.

4,578,815

WIDE AREA COVERAGE RADIO COMMUNICATION SYSTEM AND METHOD

Gary W. Persinotti, Dallas, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 7, 1983, Ser. No. 559,122
Int. Cl.[4] H04B *7/155, 7/26*
U.S. Cl. 455—15 **26 Claims**



1. In a two-way communication system of the type adapted to relay a message substantially simultaneously between a plurality of fixed location sites having corresponding radio coverage areas, the improvement comprising:

radio frequency transmission means at each of said sites arranged for transmitting on a respective different plurality of frequencies than the transmission frequencies of any other of said sites;

means coupled to each said radio frequency transmission means for selecting among the pluralities of different frequencies at said sites to provide corresponding channels at each of said sites whereby said message may be relayed between said sites; and

control means for selecting one of said channels and causing at least two of said transmission means to transmit said message substantially simultaneously on respective selected different frequencies.

4,578,816

METHOD OF SYNCHRONIZATION OF TRANSMITTER-RECEIVER STATIONS OF A FREQUENCY-JUMPING NETWORK AND A STATION FOR THE PRACTICAL APPLICATION OF SAID METHOD

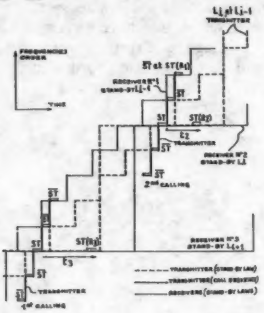
Jacques Rabain, and Joseph Swaenepoel, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Dec. 13, 1982, Ser. No. 449,214

Claims priority, application France, Dec. 15, 1981, 81 23440

Int. Cl.⁴ H04K *1/00*

U.S. Cl. 455—27 **6 Claims**



1. A method of synchronization of transmitter-receiver stations of a frequency-jumping network, comprising the steps of:

generating by identical means associated with local clocks in each of the stations carrier frequencies which are constant during time intervals of predetermined duration T wherein said frequencies are varied in jumps from one interval to the next in accordance with the output of a psuedo-random generator means;

generating, during silent periods of the network, on each of said stations reception frequencies which are constant during time intervals of duration K_iT which vary in jumps from one interval to the next in accordance with a series of successive time signals $L_1, \ldots, L_i, \ldots L_n$, which are derived from said output of said generator means such that the duration K_iT corresponding to time signal L_i is a multiple of T and increased from one time signal L_{i-1} to the next L_i in a ratio $K_i/K_{i-1}=Q_i$ wherein the time signal of each station is changed from one particular time signal to the next as the duration of said silent periods increases; and

transmitting from a station in the calling position a call sequence which sequence includes at least one group of synchronization words ST, each word having a duration T and being emitted on carrier frequencies which correspond to the time signal L_i in progress in said station in the calling position wherein said synchronization words ST are transmitted within a time interval T which is centered with respect to the timed-duration K_iT of the time interval of the time signal in progress.

4,578,817

METHOD FOR ESTABLISHING COMMUNICATIONS IN A NETWORK OF FREQUENCY-JUMPING TRANSMITTER-RECEIVER STATIONS AND A STATION FOR THE UTILIZATION OF SAID METHOD

Jacques Rabain, and Serge Adrian, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Dec. 13, 1982, Ser. No. 449,215

Claims priority, application France, Dec. 15, 1981, 81 23441

Int. Cl.⁴ H04K *1/00*

U.S. Cl. 455—27 **6 Claims**

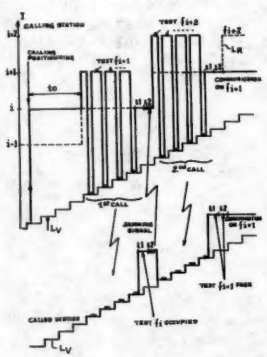
1. A method for establishing communications in a conference network of transmitter-receiver stations designed for communication by alternate simplex transmission, comprising the steps of:

generating in each of said stations a first frequency signal which is constant during each of a series of first time intervals of predetermined duration and which varies in steps in accordance with a first output of a generating circuit wherein said first output is a first series of pseudo-random values L_F at a first predetermined rate corresponding to said first time intervals;

generating in each of said stations a second frequency signal which is constant during each of a series of second time intervals of predetermined duration and which varies in steps in accordance with a second output of said generating circuit wherein said second output is second series of pseudo-random values L_R at a second predetermined rate corresponding to said second time intervals;

placing at least one of said stations in a standby position whereby said stations receive in accordance with said first frequency signal and wherein said stations communicate in a traffic frequency which is constant during each alternate transmission and is determined for each alternate transmission;

beginning an alternate transmission by designating a calling station which transmits a sequence of call messages in successive frequencies in accordance with said first frequency signal;



receiving in said designated calling station a possible traffic frequency which is determined by the instant in which the calling station transmits the call messages and by said second frequency signal wherein the duration of said second time intervals are a multiple of said first time intervals of said first frequency signal and wherein said second frequency signal is synchronized with said first freuquency signal;

receiving in said at least one station in standby position said possible traffic frequency at the end of the sequence of called messages whereby said possible traffic frequency at the end of said sequence of called messages determines the freedom of said possible traffic frequency from a signal during a time interval t_1;

transmittir a jamming signal at the same frequency and during a second time interval from a station which detected a signal in said possible traffic frequency during said first time interval t_1, in order to indicate occupation of said frequency and simultaneously providing for a receiving mode for receiving during said second time interval t_2 for any station having not detected any signal during first time interval t_1I.;

having said calling station retransmit said sequence of called messages after the end of said time interval t_2 when said possible traffic frequency is not free and subsequently receiving in another possible traffic frequency determined in accordance with said second frequency signal until said

calling station locates a possible traffic frequency which is free; and

having said calling station continue transmitting and the remainder of said stations receiving in said traffic frequency when said possible traffic frequency is free, in order to complete the establishment of communication.

4,578,818

SYSTEM FOR PROCESSING AUDIO FREQUENCY INFORMATION FOR FREQUENCY MODULATION

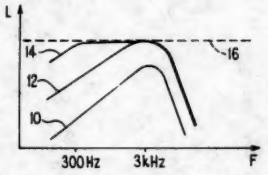
Martin Claydon, Cambridge, England, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 471,623, Mar. 3, 1983, abandoned. This application Apr. 30, 1985, Ser. No. 728,154

Claims priority, application United Kingdom, Mar. 17, 1982, 8207713

Int. Cl.[4] H04B *1/04*

U.S. Cl. 455—110 **7 Claims**



1. A processing system for a pre-emphasized audio signal for modulation on an FM transmitter, the system comprising:

a limiter amplifier including a first operational amplifier having a non-inverting input and having an output;

an amplifier filter including a second operational amplifier having an input, the input of the second operational amplifier being connected to the output of the first operational amplifier, the second operational amplifier being connected to a voltage supply rail, the limiter amplifier and the amplifier filter having responses such that when a pre-emphasized audio signal applied to the limiter amplifier is below a certain peak amplitude the pre-emphasized audio signal passes substantially undistorted through both the limiter amplifier and the amplifier filter and such that when the pre-emphasized audio signal exceeds the peak amplitude the pre-emphasized audio signal is clipped in the limiter amplifier and filtered in the amplifier filter;

means for providing a bias voltage to the non-inverting input of the first operational amplifier, the bias voltage being such that the pre-emphasized audio signal is symmetrically clipped in the limiter amplifier, and

an attenuator connected to an output of the second operational amplifier and to the non-inverting input of the first operational amplifier.

4,578,819

SPACE DIVERSITY RECEIVER

Yoshio Shimizu, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jul. 24, 1984, Ser. No. 634,033

Claims priority, application Japan, Jul. 25, 1983, 58-135583; Aug. 12, 1983, 58-147720

Int. Cl.[4] H04B *1/16, 7/02*

U.S. Cl. 455—135 **10 Claims**

1. A space diversity receiver for receiving broadcast signals comprising:

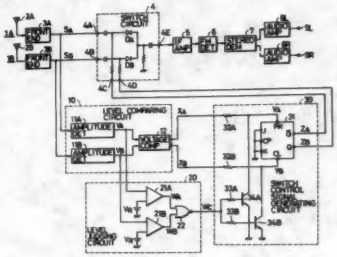
first and second antenna means;

first and second receiving means coupled to said first and second antenna means, respectively, for supplying first and second output signals in response to said broadcast signals;

switching means receiving said first and second output signals for selecting and supplying one of said output signals to an output means in response to control signals supplied thereto;

detecting means for identifying which one of said first and second output signals has a relatively better signal to noise ratio;

judging means for generating a stop signal when said signal to noise ratios of both of said first and second output signals are less than a predetermined value;



switch control means connected to said detecting means and judging means for generating said control signals so as to cause said switching means to select and supply the one of said first and second output signals identified at any time by said detecting means in the absence of said stop signal, and to cause said switching means to continuously supply one of said first and second output signals in response to the presence of said stop signal; and

said output means producing an audio output signal in response to the output signal selected by said switching means.

4,578,820

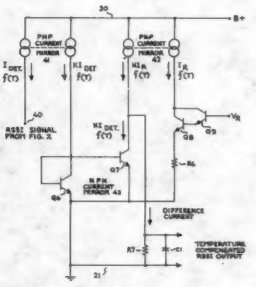
RECEIVED SIGNAL STRENGTH INDICATOR

Frederick J. Highton, Lynchburg, Va., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 5, 1984, Ser. No. 586,546

Int. Cl.[4] H04B *11/16*; H03F *3/04*

U.S. Cl. 455—154 **7 Claims**



1. An improved signal strength indicator for a radio receiver comprising:

a. a temperature sensitive input circuit coupled to said receiver for producing a first signal that has a magnitude indicative of the signal strength received by said receiver;

b. a first current mirror circuit coupled to said input circuit for producing a first mirror current whose magnitude is proportional to said first signal;

c. a temperature sensitive reference circuit for producing a reference signal;

d. a second current mirror circuit coupled to said reference circuit for producing a second mirror current whose magnitude is proportional to said reference signal;

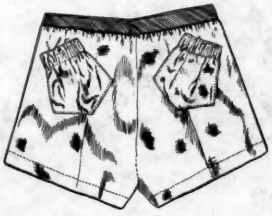
e. and a third current mirror circuit comprising a pair of transistors wherein said transistors have common bases, one transistor has a collector coupled to said bases and said first current mirror circuit, and said other transistor has a collector coupled to said second mirror circuit, for producing an output signal derived from the collector of said other transistor and having a magnitude proportional to the difference between said first mirror current and said second mirror current.

DESIGNS

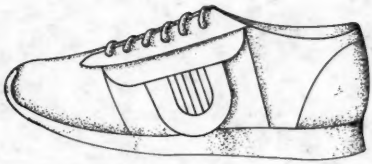
MARCH 25, 1986

283,076
CHEWING TOBACCO CAN HOLDER
Thomas J. States, Jr., 40624 Gibbel Rd., Hemet, Calif. 92343
Filed Apr. 4, 1983, Ser. No. 481,837
Term of patent 14 years
U.S. Cl. D2—400

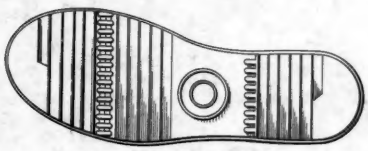
283,077
RACQUET SPORTS SHORTS
Melvin Crandall, 4207 W. Howard St., Skokie, Ill. 60076
Filed Nov. 17, 1983, Ser. No. 553,741
Term of patent 14 years
U.S. Cl. D2—42



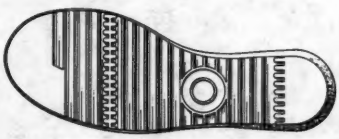
283,078
ATHLETIC SHOE WITH POCKET COVER FLAP
Robert J. Gamm, St. Louis County, Mo., assignor to Kangaroos U.S.A, Inc., St. Louis, Mo.
Continuation-in-part of Ser. No. 107,093, Dec. 12, 1979, Pat. No. Des. 261,823. This application Aug. 28, 1981, Ser. No. 297,336
Term of patent 14 years
U.S. Cl. D2—309



283,079
SHOE SOLES
Martin Michaeli, Sarrebourg-Hoff, France, assignor to Chaussures Mephisto S.A., France
Filed Feb. 4, 1983, Ser. No. 463,930
Term of patent 14 years
U.S. Cl. D2—320



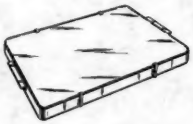
283,080
SHOE SOLE
Martin Michaeli, Sarrebourg-Hoff, France, assignor to Chaussures Mephisto S.A., France
Division of Ser. No. 463,960, Feb. 4, 1983. This application Jun. 4, 1985, Ser. No. 740,971
Term of patent 14 years
U.S. Cl. D2—322

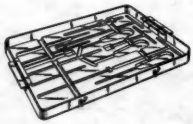


283,081
PURSE
Bernadette G. Hansen, 20048 Italy Ave. West, Lakeville, Minn. 55044
Filed Oct. 14, 1983, Ser. No. 542,155
Term of patent 14 years
U.S. Cl. D3—53

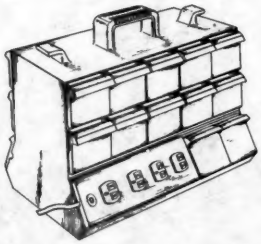
283,082
CLUTCH BAG
Bernadette G. Hansen, 20048 Italy Ave. West, Lakeville, Minn. 55044
Filed Oct. 14, 1983, Ser. No. 542,156
Term of patent 14 years
U.S. Cl. D3—53

283,083
ORTHOPEDIC TOOL BOX
Denis P. Stednitz, Redondo Beach, Calif., assignor to Ace Orthopedic Company Inc., Los Angeles, Calif.
Filed Jun. 20, 1983, Ser. No. 505,947
Term of patent 14 years
U.S. Cl. D3—74





283,084
COMBINED DRAWER UNIT AND ELECTRIC POWERBOARD
Francis R. Bannigan, 64 Duerdin St., North Clayton, Victoria, Australia (3168)
Filed Feb. 6, 1985, Ser. No. 698,579
Term of patent 14 years
U.S. Cl. D3—74



283,085

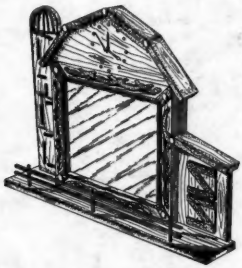
PICTURE FRAME

Robert E. Johnson, 117 Merrill St., Castlewood, S. Dak. 57223

Filed Jan. 27, 1983, Ser. No. 461,591

Term of patent 14 years

U.S. Cl. D6—303



283,086

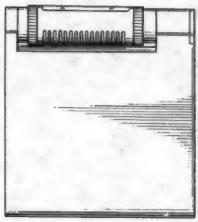
LIGHTED MIRROR

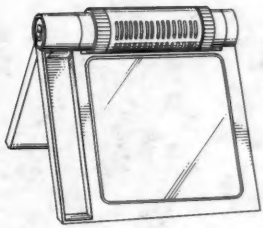
Ronald Weinhart, Encino, Calif., assignor to Hartman Products, Hawthorne, Calif.

Filed Jan. 30, 1984, Ser. No. 575,031

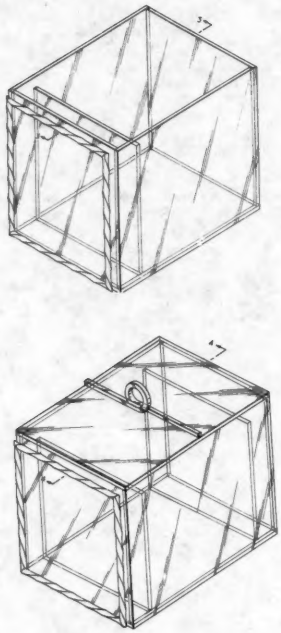
Term of patent 14 years

U.S. Cl. D6—308

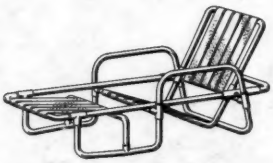




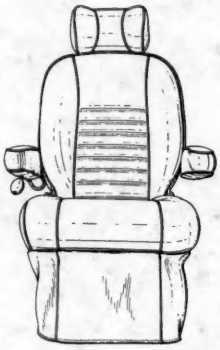
283,087
COMBINED PICTURE FRAME AND STORAGE BOX
Christina Lutz, 14547 Kellywood, Houston, Tex. 77079
Filed Nov. 15, 1982, Ser. No. 441,426
Term of patent 14 years
U.S. Cl. D6—314



283,088
LOUNGE CHAIR
Stewart K. McKay, P.O. Box 5022, Gold Coast Mail Centre, Queensland, 4217, Australia
Filed Dec. 20, 1982, Ser. No. 451,266
Term of patent 14 years
U.S. Cl. D6—361

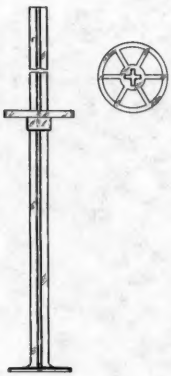


283,089
SEAT
Peter A. McArdle, Belfast, Ireland, assignor to Trimtech Limited, Belfast, Ireland
Filed Aug. 24, 1983, Ser. No. 525,875
Claims priority, application United Kingdom, Feb. 26, 1983, 1011679
Term of patent 14 years
U.S. Cl. D6—367

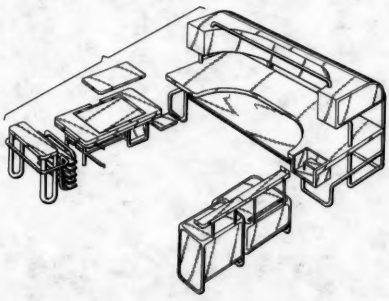


283,090
CHAIR
George C. Mulhauser, Paramus, N.J., assignor to Design Institute America, Inc., Montpelier, Ohio
Filed Aug. 29, 1983, Ser. No. 527,856
Term of patent 14 years
U.S. Cl. D6—372

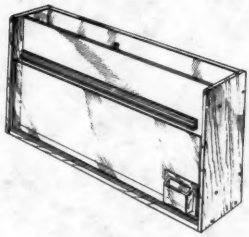
283,091
FLORAL STAND
Gene Meyer, Centerport, N.Y.
Filed Sep. 27, 1983, Ser. No. 536,438
Term of patent 14 years
U.S. Cl. D6—403



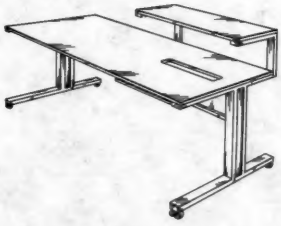
283,092
COMPUTER WORK STATION
Joan O. Johnston, 2000 E. 12th Ave., Denver, Colo. 80206
Filed Oct. 3, 1983, Ser. No. 538,477
Term of patent 14 years
U.S. Cl. D6—423



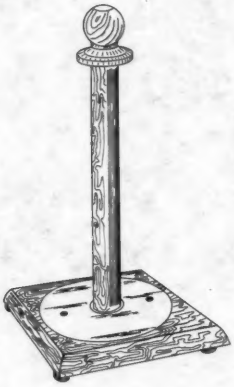
283,093
DISPLAY CASE FOR CUTLERY MERCHANDISE OR THE LIKE
John R. Tolentino, Muskego, Wis., assignor to Chicago Cutlery Consumer Products, Inc., Minneapolis, Minn.
Filed Feb. 18, 1983, Ser. No. 467,370
Term of patent 14 years
U.S. Cl. D6—470



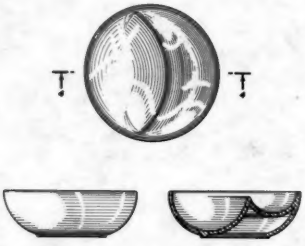
283,094
COMPUTER DESK
David R. Strand, Greenbrier, Ark., and C. Douglas Turnbull, Chicago, Ill., assignors to Strand Inc., Conway, Ark.
Filed Nov. 19, 1982, Ser. No. 443,043
Term of patent 14 years
U.S. Cl. D6—478



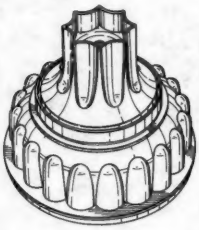
283,095
PAPER TOWEL HOLDER
Fred A. Compton, 513 McGee St., Graham, N.C. 27253
Filed Apr. 1, 1983, Ser. No. 481,336
Term of patent 14 years
U.S. Cl. D6—521



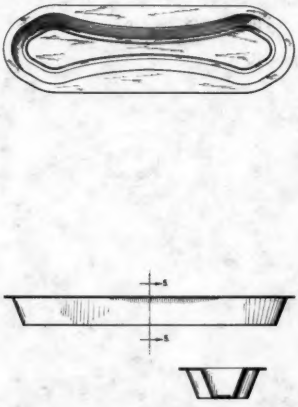
283,096
CEREAL BOWL OR THE LIKE
Gary J. Uhrik, 8764 Whitworth Dr., #6, Los Angeles, Calif. 90035
Filed Aug. 26, 1983, Ser. No. 526,673
Term of patent 14 years
U.S. Cl. D7—27



283,097
GELATIN MOLD OR THE LIKE
Robert H. C. M. Daenen, Hekelgem, and Pieter K. J. DeCoster, Aalst, both of Belgium, assignors to Dart Industries Inc., Northbrook, Ill.
Filed Aug. 9, 1983, Ser. No. 521,782
Term of patent 14 years
U.S. Cl. D7—43



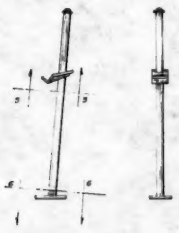
283,098
TACO TRAY
Brian K. Murdick, 3250 Oberlin Pl., Columbus, Ohio 43221, and William H. Haase, 8866 Cruden Bay Ct., Dublin, Ohio 43017
Filed Aug. 23, 1983, Ser. No. 525,757
Term of patent 14 years
U.S. Cl. D7—76



283,099
CONDIMENT CONTAINER CLOSURE
Lyle F. Shabram, Sr., P.O. Box 5537, Carmel, Calif. 93921, and Lyle F. Shabram, Jr., 1215 Surf Ave., Pacific Grove, Calif. 93950
Filed Jul. 5, 1983, Ser. No. 510,594
Term of patent 14 years
U.S. Cl. D7—392

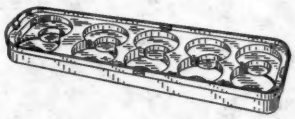
283,100
TOOL HOLDER
Robert H. Porter, 7811 76th Ave. S.W., Tacoma, Wash. 98498
Filed Oct. 18, 1982, Ser. No. 434,756
Term of patent 14 years
U.S. Cl. D8—71

283,101
WRENCH SUPPORT
Kenneth G. Lymburner, Osage, Minn. 56570
Filed Aug. 15, 1983, Ser. No. 523,571
Term of patent 14 years
U.S. Cl. D8—71

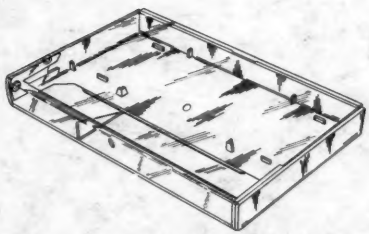


283,102
SPRING BRACKET
Eli J. Petro, Howard County, and Paul E. Pemberton, Madison County, both of Ind., assignors to Kokomo Spring Company, Kokomo, Ind.
Filed May 20, 1983, Ser. No. 496,426
Term of patent 14 years
U.S. Cl. D8—349

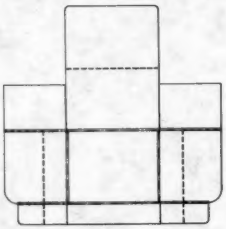
283,103
COMBINED PACKAGING AND SHIPPING CONTAINER
John J. Cushing, Chicago, Ill., and John S. Driscoll, 221 LaFox, Algonquin, Ill. 60102, assignors to John S. Driscoll, Huntley, Ill.
Filed Nov. 14, 1983, Ser. No. 551,305
Term of patent 14 years
U.S. Cl. D9—345



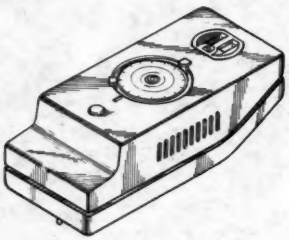
283,104
PACKAGING CONTAINER FOR COMPUTER SOFTWARE
Donald E. Bigando, Delray Beach, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Sep. 7, 1983, Ser. No. 529,905
Term of patent 14 years
U.S. Cl. D9—418



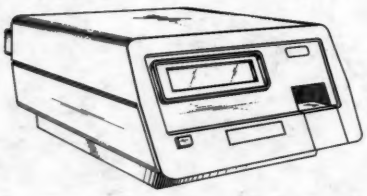
283,105
CARTON BLANK
Arthur H. Dornbusch, and Barbara A. Hainti, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Sep. 14, 1983, Ser. No. 531,887
Term of patent 14 years
U.S. Cl. D9—433



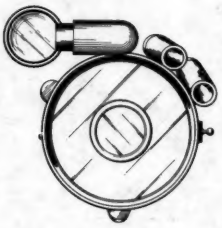
283,106
TIMER
Tai-Her Yang, 5-1 Tay Pyng Street, Hwu Jenn, Jang Huah Shiann, Taiwan
Filed Aug. 4, 1983, Ser. No. 520,321
Term of patent 14 years
U.S. Cl. D10—40



283,107
REFLECTANCE PHOTOMETER
Kenneth D. Collister, Elkhart, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.
Filed Jul. 29, 1983, Ser. No. 518,655
Term of patent 14 years
U.S. Cl. D10—46

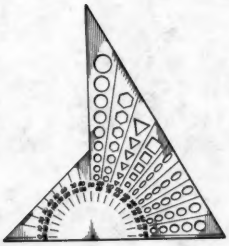


283,108
STANDARD PROJECTOR MARKER FOR MARKING OPTICAL LENSES
Luis E. Saumell, 6318 SW. 23 St., Miami, Fla. 33155
Filed Nov. 12, 1982, Ser. No. 440,830
Term of patent 14 years
U.S. Cl. D10—46



283,109
CRACK-INDICATION ELEMENT
Kennert Röshoff, 40 Stormvägen, S-951 49 Luleå, Sweden
Filed Aug. 24, 1983, Ser. No. 525,922
Claims priority, application Sweden, Feb. 24, 1983, 83-0524; Aug. 22, 1983, 83-2138
Term of patent 14 years
U.S. Cl. D10—46

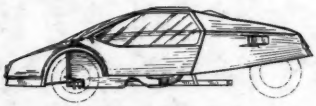
283,110
MECHANICAL DRAWING IMPLEMENT
Walter H. Hudson, 4201 Folker St., #C102, Anchorage, Ak. 99508
Filed Feb. 7, 1983, Ser. No. 464,792
Term of patent 14 years
U.S. Cl. D10—62

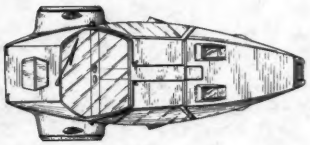


283,111
TROPHY
Gilbert F. Meekins, Alexandria, Va., assignor to United Way of America, Alexandria, Va.
Filed Jan. 12, 1984, Ser. No. 570,924
Term of patent 14 years
U.S. Cl. D11—161

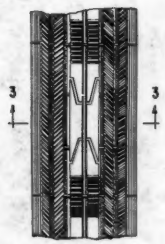
283,112
ARTICULATED, COLLAPSIBLE SLED
Samuel J. McFrisby, Ecorse, Mich., assignor to Joseph A. Ulicne, Grosse Ile, Mich., a part interest
Filed May 19, 1983, Ser. No. 496,268
Term of patent 14 years
U.S. Cl. D12—10

283,113
BODY FOR THREE-WHEELED MOTOR VEHICLE
David J. Stollery, Laguna Beach, Calif., assignor to Fire Arrow, Inc., Laguna Beach, Calif.
Filed Jul. 22, 1983, Ser. No. 516,045
Term of patent 14 years
U.S. Cl. D12—85

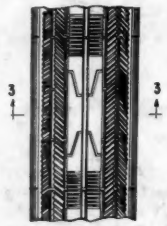




283,114
BICYCLE TIRE TREAD
Eiji Fukuchi, Kagawa, Japan, assignor to Mitsuboshi Belting Ltd., Kobe, Japan
Filed Dec. 6, 1982, Ser. No. 447,393
Claims priority, application Japan, Sep. 18, 1982, 57-42652
The portion of the term of this patent subsequent to Mar. 25, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D12—136



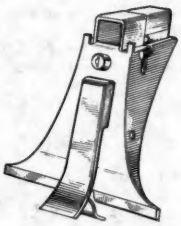
283,115
BICYCLE TIRE TREAD
Eiji Fukuchi, Kagawa, Japan, assignor to Mitsuboshi Belting Ltd., Nagata, Japan
Filed Dec. 6, 1982, Ser. No. 447,394
Claims priority, application Japan, Sep. 18, 1982, 57-42651
The portion of the term of this patent subsequent to Mar. 25, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D12—136



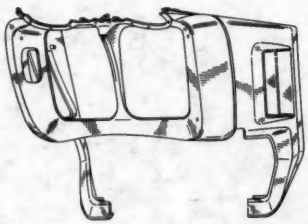
283,116
VEHICLE TIRE
Akihiro Nakatani, Kakogawa, Japan, assignor to Sumitomo Rubber Industries Ltd., Hyogo, Japan
Filed Oct. 20, 1983, Ser. No. 543,966
Claims priority, application Japan, Jun. 10, 1983, 58-25139
Term of patent 14 years
U.S. Cl. D12—147

283,117
VEHICLE LUGGAGE RACK STANCHION
John A. Bott, 931 Lakeshore Dr., Grosse Pointe Shores, Mich. 48236
Filed May 24, 1983, Ser. No. 497,498
Term of patent 14 years
U.S. Cl. D12—157

283,118
LOAD CARRIER ATTACHMENT FOR CARS AND SIMILAR VEHICLES
Tore Eklund, Larstorpsvägen 13, S-591 70 Motala, Sweden
Filed Jan. 31, 1983, Ser. No. 462,686
Claims priority, application Sweden, Aug. 2, 1982, 82-1923
Term of patent 14 years
U.S. Cl. D12—157

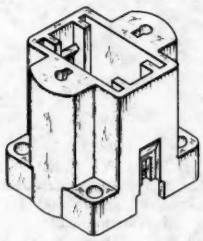


283,119
LOWER FAIRING FOR MOTORCYCLES
Karl H. Abe, Steinebach/Woerthsee, and Klaus V. Gevert, Munich, both of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke AG, Fed. Rep. of Germany
Filed Nov. 9, 1983, Ser. No. 550,116
Claims priority, application Fed. Rep. of Germany, May 9, 1983, MR 13415
Term of patent 14 years
U.S. Cl. D12—182

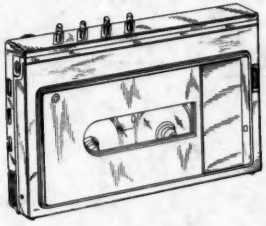


283,120
TRIM PIECE FOR AN AUTOMOBILE HOOD
Ulric W. Trombley, Chisago City, and Richard J. Nozel, West St. Paul, both of Minn., assignors to Double D Specialties, Inc., St. Paul, Minn.
Filed Sep. 29, 1983, Ser. No. 537,033
Term of patent 14 years
U.S. Cl. D12—190

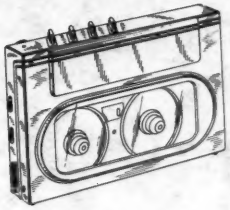
283,121
FLUORESCENT LAMP HOLDER
Klaus Oesterheld, Woodside; Michael Franovic, Forest Hills, and Carlos Martinez, Brooklyn, all of N.Y., assignors to North American Philips Corporation, New York, N.Y.
Continuation of Ser. No. 425,218, Sep. 28, 1982, abandoned. This application Dec. 17, 1984, Ser. No. 682,489
Term of patent 14 years
U.S. Cl. D13—25



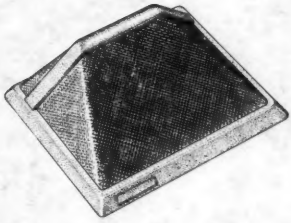
283,122
COMBINED TAPE PLAYER AND RADIO
Kaoru Sumita, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Dec. 2, 1983, Ser. No. 557,464
Claims priority, application Japan, Jun. 3, 1983, 58-23857
Term of patent 14 years
U.S. Cl. D14—5



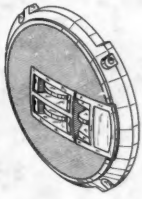
283,123
TAPE PLAYER
Kaoru Sumita, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Dec. 2, 1983, Ser. No. 557,465
Claims priority, application Japan, Jun. 3, 1983, 58-23855
Term of patent 14 years
U.S. Cl. D14—6



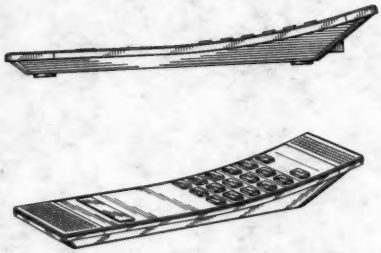
283,124
MICROPHONE
Ronald M. Kolb, Skokie, Ill., assignor to Shure Brothers, Inc., Evanston, Ill.
Filed Nov. 23, 1983, Ser. No. 554,315
Term of patent 14 years
U.S. Cl. D14—12



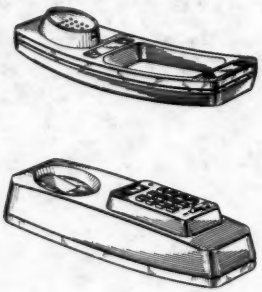
283,125
LOUDSPEAKER PANEL
Grant M. N. Davidson, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Dec. 15, 1983, Ser. No. 561,761
Claims priority, application United Kingdom, Jun. 29, 1983, 1,013,833
Term of patent 14 years
U.S. Cl. D14—39



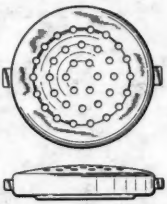
283,126
TELEPHONE
Eric J. Marshall, 5 Carlton Gardens, London SW1, United Kingdom
Filed Jun. 17, 1983, Ser. No. 505,555
Claims priority, application United Kingdom, Dec. 21, 1982, 1010428
Term of patent 14 years
U.S. Cl. D14—53



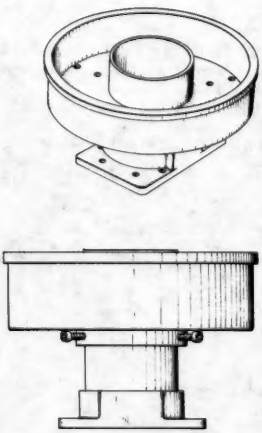
283,127
TELEPHONE RECEIVER AND BASE SET
Chan Hai-Ping, Hong Kong, Hong Kong, assignor to National Telecommunication System, Ltd., Hong Kong, Hong Kong
Filed May 10, 1983, Ser. No. 493,360
Term of patent 14 years
U.S. Cl. D14—53



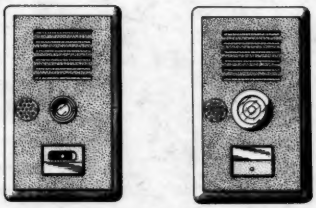
283,128
GERMICIDAL DISC CONTAINER FOR STERILIZING A TELEPHONE MOUTHPIECE
Peter Bate, Don Mills, Canada, assignor to Dominion Odor Control Ltd., Don Mills, Canada
Filed Aug. 30, 1983, Ser. No. 527,837
Term of patent 14 years
U.S. Cl. D14—59



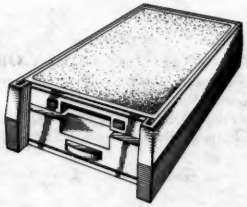
283,129
MICROWAVE FEED HORN
Frederic Fourcher, Corona del Mar; Daniel A. Bathker, La Crescenta, both of Calif., and Thomas W. Cole, Arlington, Va., assignors to Miralite International, Inc., Santa Ana, Calif.
Filed Jun. 30, 1983, Ser. No. 509,645
Term of patent 14 years
U.S. Cl. D14—90



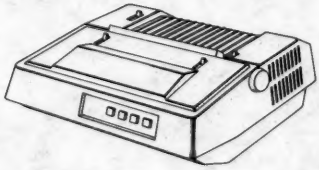
283,130
COMBINED DOOR VIEWER AND TWO-WAY INTERCOM UNIT
Charles B. Boenning, Cincinnati, Ohio, assignor to Claiborne Electronics, Inc., Cincinnati, Ohio
Filed Nov. 30, 1983, Ser. No. 556,283
Term of patent 14 years
U.S. Cl. D14—92



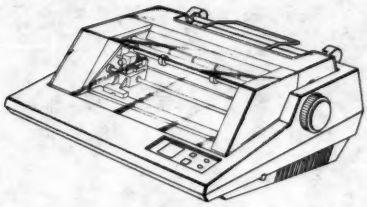
283,131
MICROFLOPPY DISK DRIVE
Daniel A. Baker, Dallas, Tex., assignor to Percom Data Corporation, Dallas, Tex.
Filed Feb. 3, 1984, Ser. No. 576,749
Term of patent 14 years
U.S. Cl. D14—109



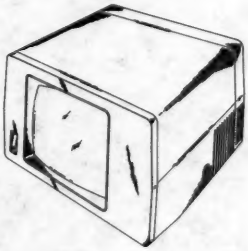
283,132
PRINTER FOR ELECTRONIC COMPUTER
Nobuki Matsumoto, Miura, Japan, assignor to Ricoh Company, Ltd., Japan
Filed Aug. 16, 1983, Ser. No. 523,721
Claims priority, application Japan, Feb. 23, 1983, 58-7154
Term of patent 14 years
U.S. Cl. D14—111



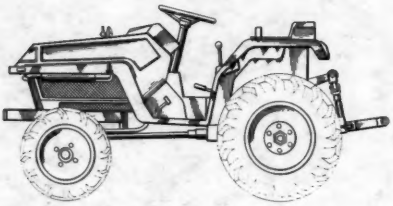
283,133
PRINTER FOR ELECTRONIC COMPUTER
Kenichi Nakade, Kanagawa, and Masami Toyoshima, Tokyo, both of Japan, assignors to Ricoh Company, Ltd., Japan
Filed Sep. 29, 1983, Ser. No. 537,359
Claims priority, application Japan, Mar. 31, 1983, 58-013455
Term of patent 14 years
U.S. Cl. D14—111

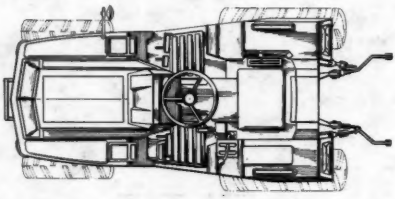


283,134
DISPLAY FOR DATA-PROCESSING WORKSTATION
Peter J. Mendel, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Mar. 22, 1982, Ser. No. 360,136
Term of patent 14 years
U.S. Cl. D14—113

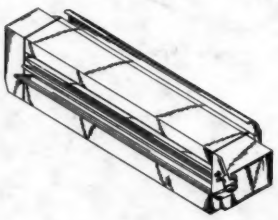


283,135
AGRICULTURAL TRACTOR
Genichi Funabashi; Akira Teraoka, both of Sennan, and Tadashi Nakamura, Kawachinagano, all of Japan, assignors to Kubota Ltd., Osaka, Japan
Filed Sep. 29, 1983, Ser. No. 536,976
Term of patent 14 years
U.S. Cl. D15—23

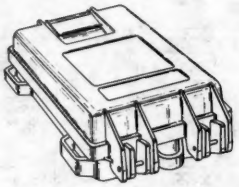


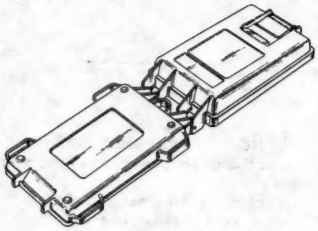


283,136
COPYING MACHINE
Andrew T. Serbinski, New York, N.Y., assignor to Ozalid Corporation, Mahwah, N.J.
Filed Dec. 22, 1983, Ser. No. 564,310
Term of patent 14 years
U.S. Cl. D16—27

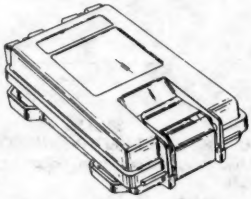


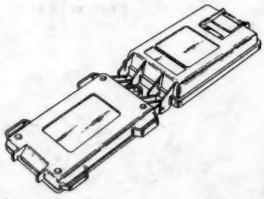
283,137
COMBINED CALCULATOR AND PROTECTIVE CASE
Christopher J. Hamar, Leeds, England, assignor to Zengrange Limited, Leeds, England
Filed Jul. 25, 1983, Ser. No. 516,896
Claims priority, application United Kingdom, Jan. 25, 1983, 1011046
Term of patent 14 years
U.S. Cl. D18—2



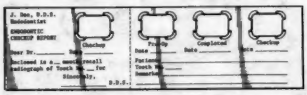


283,138
PROTECTIVE CASE FOR A CALCULATOR OR THE LIKE
Christopher J. Hamar, Leeds, England, assignor to Zengrange Limited, Leeds, England
Filed Jul. 25, 1983, Ser. No. 516,877
Claims priority, application United Kingdom, Jan. 25, 1983, 1 011 045
Term of patent 14 years
U.S. Cl. D18—11



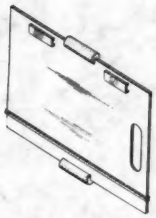


283,139
COMBINED ENDODONTIC X-RAY MOUNTS AND POSTAL CARD CORRESPONDENCE FORM
Milton G. Deemer, 3155 Dear Meadow Dr., Danville, Calif. 94526
Filed May 10, 1982, Ser. No. 376,273
Term of patent 14 years
U.S. Cl. D19—2

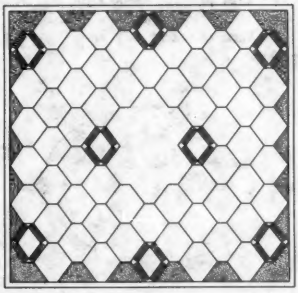


283,140
WRITING INSTRUMENT
Richard J. Petrillo, Norwell, Mass., assignor to The Gillette Company, Boston, Mass.
Filed Dec. 28, 1983, Ser. No. 566,232
Term of patent 14 years
U.S. Cl. D19—49

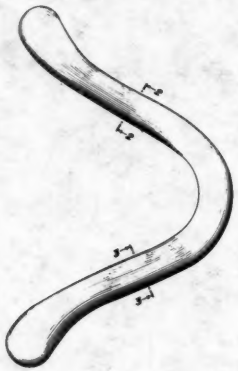
283,141
CLIPBOARD
Thomas Koves, 645 N. Cherokee Ave., Los Angeles, Calif. 90004
Filed Sep. 16, 1983, Ser. No. 532,750
Term of patent 14 years
U.S. Cl. D19—88



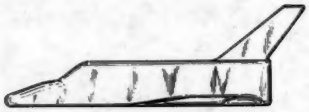
283,142
GAME BOARD
Milton Lewis, 1721 Eager St., Baltimore, Md. 21205
Filed Dec. 27, 1982, Ser. No. 437,203
Term of patent 14 years
U.S. Cl. D21—34



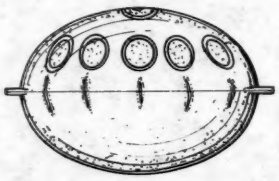
283,143
BOOMERANG
Peter R. Ruhf, R.D. #1, Barto, Pa. 19504, and Frank S. Smirne, 1240 Washington St., Whitehall, Pa. 18052
Filed Dec. 5, 1983, Ser. No. 558,053
Term of patent 14 years
U.S. Cl. D21—82



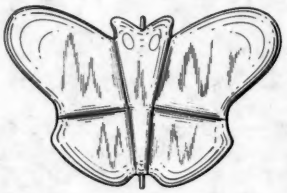
283,144
SPACESHIP TOY BALLOON
Fritz Jensen, Nordbovej 20 C, DK-9800 Hjorring, Denmark
Filed Feb. 13, 1984, Ser. No. 579,518
Term of patent 14 years
U.S. Cl. D21—84



283,145
SIMULATIVE TOY BALLOON
Fritz Jensen, Nordbovej 20 C, DK-9800 Hjorring, Denmark
Filed Feb. 13, 1984, Ser. No. 579,520
Term of patent 14 years
U.S. Cl. D21—84



283,146
BUTTERFLY TOY BALLOON
Fritz Jensen, Nordbovej 20 C, DK-9800 Hjorring, Denmark
Filed Feb. 13, 1984, Ser. No. 579,551
Term of patent 14 years
U.S. Cl. D21—84

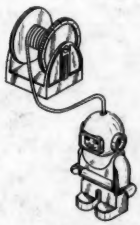


283,147
SLEDGE TOY
Yeong F. Yang, 3 Fl., No. 16-4, Guan In St., An Ping District, Tainan, Taiwan
Filed Dec. 27, 1983, Ser. No. 565,971
Term of patent 14 years
U.S. Cl. D21—149

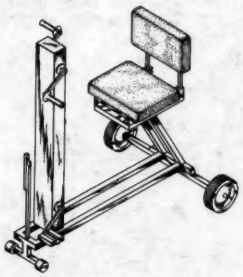
283,148
TOY MANNEQUIN
Patrick J. Coyne, Cleveland Heights, Ohio, assignor to Meritus Industries, Inc., Florham Park, N.J.
Filed May 19, 1983, Ser. No. 496,290
Term of patent 14 years
U.S. Cl. D21—154

283,149
TOY WALRUS FIGURE
Jacob Nielsen, Copenhagen, Denmark, assignor to Interlego AG, Baar, Switzerland
Filed Dec. 15, 1983, Ser. No. 561,665
Term of patent 14 years
U.S. Cl. D21—157

283,150
TOY DIVER FIGURE WITH HOIST
Carlo A. Jensen, Helsingor, Denmark, assignor to Interlego AG, Baar, Switzerland
Filed Dec. 15, 1983, Ser. No. 561,663
Term of patent 14 years
U.S. Cl. D21—177

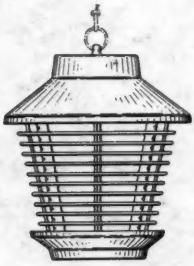


283,151
THERAPEUTIC EXERCISING MACHINE
Fred E. Knief, P.O. Box 836, San Andreas, Calif. 95249
Filed Jun. 15, 1984, Ser. No. 621,277
Term of patent 14 years
U.S. Cl. D21—194



283,152
HOUSING FOR ELECTRONIC INSECT KILLER
Joseph M. Cunning, Cohasset, Mass., assignor to Armatron International, Inc., Melrose, Mass.
Filed Feb. 27, 1984, Ser. No. 583,638
Term of patent 14 years
U.S. Cl. D22—19

283,153
HOUSING FOR ELECTRONIC INSECT KILLER
Sal DeYoreo, Andover, Mass., assignor to Armatron International, Inc., Melrose, Mass.
Filed Feb. 27, 1984, Ser. No. 583,641
Term of patent 14 years
U.S. Cl. D22—19

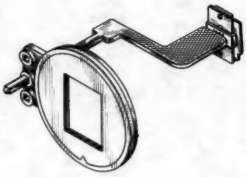


283,154
AIR MANIFOLD UNIT
Eugene T. McKinnon, Pacific Palisades, Calif., assignor to Gem Products, Inc., Garden Grove, Calif.
Filed Jul. 25, 1983, Ser. No. 516,747
Term of patent 14 years
U.S. Cl. D23—40

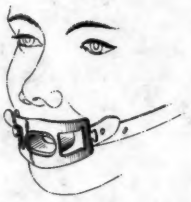
283,155
PEDESTAL SINK
John P. Ronvik, Palos Heights, Ill., assignor to Sears, Roebuck & Co., Chicago, Ill.
Filed Dec. 2, 1983, Ser. No. 557,717
Term of patent 14 years
U.S. Cl. D23—61

283,156
ELECTRIC FAN
Piergiorgio Mandelli, Via Salvagnoli, 5, 20125 Milan, and Franco Mandelli, Viale Jenner, 20, 20100 Milan, both of Italy
Filed Nov. 20, 1984, Ser. No. 673,322
Term of patent 14 years
U.S. Cl. D23—158

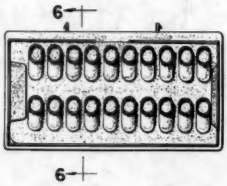
283,157
DEVICE FOR POSITIONING DENTAL X-RAY FILM
Robert Maldonado, Santa Clara, and Clark E. Loughry, San Jose, both of Calif., assignors to The S. S. White Company, Holmdel, N.J.
Filed Mar. 16, 1983, Ser. No. 475,823
Term of patent 14 years
U.S. Cl. D24—2



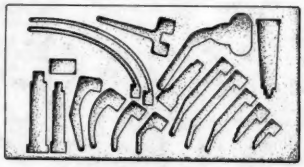
283,158
ENDOSCOPIC BITE BLOCK
Frank W. Jackson, Twillingate R.D. 3, Mechanicsburg, Pa. 17055, assignor to Frank W. Jackson, Mechanicsburg, Pa.
Filed Apr. 8, 1983, Ser. No. 483,397
Term of patent 14 years
U.S. Cl. D24—29



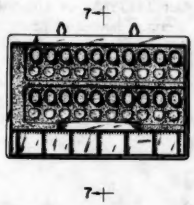
283,159
COMBINED MICROBIOLOGICAL TEST TRAY AND HOLDER
James H. Godsey, Huntington Station, N.Y., assignor to American Home Products Corporation (Del.), New York, N.Y.
Filed Mar. 4, 1983, Ser. No. 472,378
Term of patent 14 years
U.S. Cl. D24—31



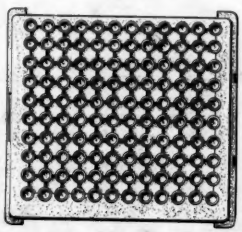
283,160
EQUIPMENT STORAGE TRAY OR THE LIKE
Mark E. Steinman, 6831 Uppingham Dr., Fayetteville, N.C. 28306
Filed Jun. 16, 1983, Ser. No. 504,743
Term of patent 14 years
U.S. Cl. D24—31



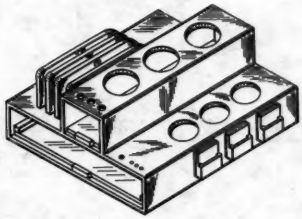
283,161
COMBINED MICROBIOLOGICAL TEST TRAY AND HOLDER
James H. Godsey, Huntington Station, N.Y., assignor to American Home Products Corporation (Del.), New York, N.Y.
Filed Jun. 16, 1983, Ser. No. 504,997
Term of patent 14 years
U.S. Cl. D24—31



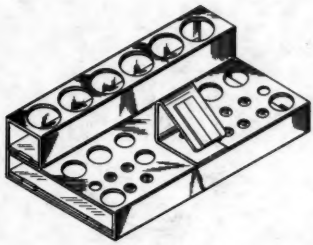
283,162
MICROBIOLOGICAL TEST TRAY
James H. Godsey, Huntington Station, N.Y., assignor to American Home Products Corporation (Del.), New York, N.Y.
Filed Mar. 4, 1983, Ser. No. 472,377
Term of patent 14 years
U.S. Cl. D24—31



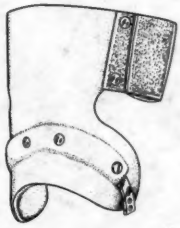
283,163
ORGANIZER FOR HOLDING DRUG DETECTION KIT ARTICLES OR THE LIKE
Mahendra K. Pandya, 8018 Daytona Ave., NW., Massillon, Ohio 44646
Filed Nov. 18, 1983, Ser. No. 553,165
Term of patent 14 years
U.S. Cl. D24—31



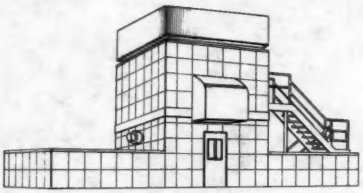
283,164
ORGANIZER FOR HOLDING DRUG DETECTION KIT ARTICLES OR THE LIKE
Mahendra K. Pandya, 8018 Daytona Ave., NW., Massillon, Ohio 44646
Filed Nov. 18, 1983, Ser. No. 553,167
Term of patent 14 years
U.S. Cl. D24—31



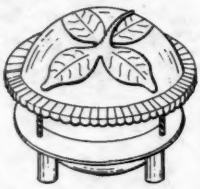
283,165
THIGH COMPONENT FOR A KNEE BRACE
Darryl L. Womack, Lakewood, Colo., assignor to Scott Orthopedics, Inc., Denver, Colo.
Filed Jun. 1, 1983, Ser. No. 500,165
Term of patent 14 years
U.S. Cl. D24—64



283,166
FOOD SERVICE BUILDING
Glen A. Gardner, Castro Valley; Richard J. Kung, and Claude E. Salzberger, both of San Francisco, all of Calif., assignors to The Krystal Company, Chattanooga, Tenn.
Filed Jul. 14, 1983, Ser. No. 513,760
Term of patent 14 years
U.S. Cl. D25—1

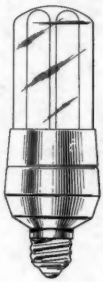


283,167
STATIONARY REFRESHMENT STAND
George Perry, 108 Mitchell Pl., Daytona Beach, Fla. 32108
Filed Apr. 13, 1983, Ser. No. 484,530
Term of patent 14 years
U.S. Cl. D25—10

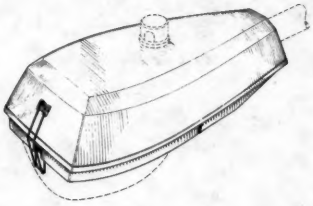


283,168
POOL ACCESS STAIR FOR THE DISABLED
Lewis J. Daly, 5890 Pierson Rd., Fayetteville, N.Y. 13066
Filed Aug. 16, 1983, Ser. No. 523,576
Term of patent 14 years
U.S. Cl. D25—62

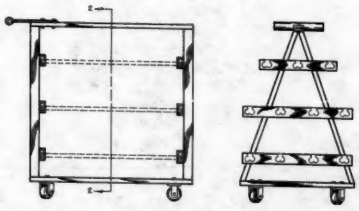
283,169
FLUORESCENT LAMP OR THE LIKE
Julian J. Wierzbicki, Peabody; Harold L. Hough, Beverly, and Andre C. Bouchard, Peabody, all of Mass., assignors to GTE Products Corporation, Stamford, Conn.
Filed Jun. 22, 1984, Ser. No. 623,607
Term of patent 14 years
U.S. Cl. D26—3



283,170
ROADWAY LUMINAIRE
Jon M. Newgard, and Walter C. Pitts, both of Louisville, Ky., assignors to General Electric Company, Hendersonville, N.C.
Filed Oct. 11, 1983, Ser. No. 540,939
Term of patent 14 years
U.S. Cl. D26—71



283,171
CART FOR HOLDING ROLLS OF WIRE
Gary E. Smith, 21620 Prospect Ct., Hayward, Calif. 94541, and Edward D. Parks, 7755 Fairoaks Dr., Pleasanton, Calif. 94566
Filed Feb. 21, 1980, Ser. No. 123,409
Term of patent 14 years
U.S. Cl. D34—21



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 25TH DAY OF MARCH, 1986

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. J. Sparks & Company: *See—*
Stehouwer, William J., 4,578,139, Cl. 156-384.000.

A. O. Smith Corporation: *See—*
Hughes, Dennis R., 4,577,681, Cl. 165-109.100.
Lusk, Donald I., 4,578,293, Cl. 428-35.000.

AB ASEA-ATOM: *See—*
Borrman, Bo; Hellman, Erik; Lundin, Nils; and Ode, Bengt, 4,578,241, Cl. 376-446.000.

Abbott Laboratories: *See—*
Schaffel, Steven D., 4,578,349, Cl. 435-7.000.

Abe, Kaoru: *See—*
Fuse, Genzo; Abe, Kaoru; and Matsumoto, Isao, 4,578,005, Cl. 409-140.000.

Abe, Riichi; Tsuruta, Katsuji; and Tsujikado, Seiji, to Kabushiki Kaisha Komatsu Seisakusho. Positioning control system. 4,578,748, Cl. 364-167.000.

Abe, Shinji: *See—*
Ohta, Hiroshi; Abe, Shinji; and Fukushima, Kiyoto, 4,578,314, Cl. 428-403.000.

Abe, Wataru: *See—*
Kitta, Toshiyuki; Abe, Wataru; and Takase, Tadaaki, 4,577,443, Cl. 52-230.000.

Acla, Howard L.: *See—*
Ritsko, Joseph E.; and Acla, Howard L., 4,578,251, Cl. 423-55.000.

Acrowood Corporation: *See—*
Terrenzio, Gabriel M., 4,577,806, Cl. 241-275.000.

Adachi, Keiichi: *See—*
Watanabe, Toshiyuki; Yagihara, Morio; and Adachi, Keiichi, 4,578,346, Cl. 430-548.000.

Adams, Jurgen; and Scholl, Hans-Peter, to Kienzle Apparate GmbH. Arrangement for controlling an electronic taximeter. 4,578,760, Cl. 364-467.000.

Adelberger, Donald L.: *See—*
Granzow, Robert H.; Daulton, Richard H.; Placke, Dale L.; Adelberger, Donald L.; Gross, Jack R.; and Nagy, Charles S., 4,578,009, Cl. 414-43.000.

ADIDAS Fabrique de Chaussures de Sport: *See—*
Chassaing, Jacques, 4,577,419, Cl. 36-89.000.

Adkins, David G., to Mead Corporation, The. Photosensitive imaging system employing oil-containing microcapsules. 4,578,339, Cl. 430-138.000.

Adlhoch, Wolfgang H.; and Lambertz, Johannes, to Rheinische Braunkohlenwerke AG. Venturi scrubber for dust-laden gases. 4,578,226, Cl. 261-71.000.

Adrian, Serge: *See—*
Rabain, Jacques; and Adrian, Serge, 4,578,817, Cl. 455-27.000.

Advanced Micro Devices, Inc.: *See—*
Peterson, David R., 4,577,392, Cl. 29-571.000.

AGB Research PLC: *See—*
Roberts, Lyn M.; Shrier, Robert L.; and Laxton, Raymond, 4,578,700, Cl. 358-84.000.

Agfa-Gevaert AG: *See—*
Geyken, Erwin; Heckl, Franz; Kastl, Alfons; Lehnert, Klaus; and Loistl, Rudolf, 4,577,949, Cl. 354-319.000.
Hosel, Peter; and Schindlbeck, Gunther, 4,577,452, Cl. 53-266.00R.

Agfa-Gevaert Aktiengesellschaft: *See—*
Greiner, Joachim; and Nippe, Burkhard, 4,578,280, Cl. 427-47.000.

Ahn, Kie Y.; DiStefano, Thomas H.; and Jipson, Victor B., to International Business Machines Corporation. High performance optical storage medium with separate mechanical servo tracks embedded within the medium. 4,578,788, Cl. 369-275.000.

Ahrens, Kurt H.: *See—*
Schickaneder, Helmut; Szeleny, Istvan; Morsdorf, Peter; and Ahrens, Kurt H., 4,578,389, Cl. 514-254.000.

Aibe, Toshio: *See—*
Nishino, Hiroshi; and Aibe, Toshio, 4,578,256, Cl. 423-210.000.

Air-Lock Plastics, Inc.: *See—*
Talmon, Floyd H.; and Talmon, David K., 4,577,907, Cl. 297-452.000.

Air Products and Chemicals, Inc.: *See—*
Dawson, Daniel J.; and Otteson, Kenneth M., 4,578,515, Cl. 564-215.000.
Johnson, Thomas A.; and Ford, Michael E., 4,578,517, Cl. 564-479.000.
Newton, Charles L., 4,578,153, Cl. 203-99.000.

Aisin Seiki Kabushiki Kaisha: *See—*
Nakazawa, Takaaki; Kazaoka, Kenichi; Okazaki, Nobuo; and Nakashima, Kunihiko, 4,578,592, Cl. 307-10.00R.
Nishio, Shigeru, 4,577,607, Cl. 123-516.000.
Saida, Chiaki, 4,577,742, Cl. 192-106.200.

Aitken, Derek, to Applied Materials, Inc. Apparatus and methods for ion implantation. 4,578,589, Cl. 250-492.200.

Aizawa, Masanobu: *See—*
Teshima, Toru; Aizawa, Masanobu; Yoshida, Mitsunari; Shima, Toshiyuki; and Takeda, Masakazu, 4,578,043, Cl. 445-40.000.

Akiyama, Toshiyuki: *See—*
Ozawa, Naoki; Akiyama, Toshiyuki; Nagahara, Shuusaku; Ohba, Shinya; Ando, Haruhisa; and Ozaki, Toshifumi, 4,578,707, Cl. 358-212.000.

Aktieselskabet Nordiske Kabel-OG Traadfabriker: *See—*
Rasmussen, Erik, 4,578,184, Cl. 209-3.000.

Albers, Horst: *See—*
Cyriacy, Frieda; Albers, Horst; and Havemann, Ingeborg, 4,577,703, Cl. 175-79.000.

Albers, Lloyd R., to Phillips Petroleum Company. Control of a fractional distillation process. 4,578,152, Cl. 203-1.000.

Albert, Winfried: *See—*
Siedel, Joachim; Neumann, Ulrich; Ziegenhorn, Joachim; Batz, Hans-Georg; Lenz, Helmut; Pautz, Brigitte; and Albert, Winfried, 4,578,361, Cl. 436-547.000.

Alcatel Thomson Faisceaux Hertziens: *See—*
Cruchon, Jean-Claude; and Schubert, Jean-Denis, 4,578,657, Cl. 333-211.000.

Alcon (Puerto Rico) Inc.: *See—*
Cruz, Mamerto M., Jr., 4,578,067, Cl. 604-368.000.

Alderman, Robert J. Line powered flasher circuit for ringing signal. 4,578,542, Cl. 179-84.00L.

Aldrich, Michael A. Batting aid. 4,577,864, Cl. 273-26.00E.

Aldridge, Clyde L.: *See—*
Bearden, Roby, Jr.; and Aldridge, Clyde L., 4,578,182, Cl. 208-112.000.

Alexander, Jack L. Magnetic-pneumatic liquid level control. 4,577,657, Cl. 137-448.000.

Algieri, Aldo A.: *See—*
Crenshaw, Ronnie R.; and Algieri, Aldo A., 4,578,471, Cl. 546-193.000.

Alhauser, Erich. Ion exchange apparatus to improve the quality of potable water. 4,578,187, Cl. 210-93.000.

Allen Engineering Corporation: *See—*
Allen, J. Dewayne; and Randolph, Edward F., 4,577,993, Cl. 404-112.000.

Allen, J. Dewayne; and Randolph, Edward F., to Allen Engineering Corporation. Power trowel with cam-actuated blade pitch adjustment mechanism. 4,577,993, Cl. 404-112.000.

Allen, Richard C.; Effland, Richard C.; and Klein, Joseph T., to Hoechst-Roussel Pharmaceuticals Incorporated. Cholinergic function increasing 3-[N-(pyridyl) carbamoyl]-1,4-dihydropyridines. 4,578,394, Cl. 514-332.000.

Allen, Richard J.; and Youden, Richard W., to Signetics Corporation. Continuity/leakage tester for electronic circuits. 4,578,637, Cl. 324-73.0PC.

Allen, Spencer W.: *See—*
Jones, Donald H.; Allen, Spencer W.; and Chimes, Philip R., 4,578,763, Cl. 364-513.000.

Allen, Winthrop D., III: *See—*
Gilda, Patricia; Mann, William F.; and Allen, Winthrop D., III, 4,577,758, Cl. 206-496.000.

Allied Corporation: *See—*
Chai, Bruce H.; Buehler, Ernest; Flynn, John J.; and Morris, Robert C., 4,578,146, Cl. 156-623.00R.
Dimmit, Jeffrey H.; Van Der Puy, Michael; and Soriano, David S., 4,578,250, Cl. 423-22.000.
Kirtley, Stephen W.; and Wooster, George S., 4,578,283, Cl. 427-85.000.
Krasinski, Jerzy S.; Heller, Donald F.; and Kafri, Oded, 4,577,940, Cl. 350-502.000.

Alois Kober KG: *See—*
Kober, Kurt; Wohrle, Rudolf; and Kohler, Robert, 4,577,882, Cl. 280-446.00R.

Alps Electric Co., Ltd.: *See—*
Takikawa, Makito, 4,577,521, Cl. 74-89.200.
Tanaka, Hideto; and Fujisawa, Kyuichi, 4,578,685, Cl. 346-139.00R.

Aisthom-Atlantique: *See—*
Mech, Christian; and Gironde, Daniel, 4,578,608, Cl. 310-112.000.

Aluminum Company of America: *See—*
Diekhoff, Hans H., 4,578,007, Cl. 413-6.000.

ALZA Corporation: *See—*
Urquhart, John; and Theeuwes, Felix, 4,578,075, Cl. 604-892.000.

Amabile, Robert N.; Judd, Richard E.; and Gromelski, Stanley J., Jr., to GAF Corporation. Thixotropic rust removal coating and process. 4,578,407, Cl. 524-55.000.

Amada Company Limited: *See—*
Hirata, Tadashi; and Amano, Tadashi, 4,577,538, Cl. 83-467.00R.

Amano, Akira; and Sasaki, Kazuhiko, to Honda Giken Kogyo Kabushiki Kaisha. Grass cutting height indicator for lawn mower and tractor combination. 4,577,455, Cl. 56-17.100.
Amano, Tadashi: *See*—
Hirata, Tadashi; and Amano, Tadashi, 4,577,538, Cl. 83-467.00R.
AMCA International Corporation: *See*—
Klabunde, Steven E.; Hankwitz, Edward H.; and Maastricht, Charles, 4,577,535, Cl. 82-2.00E.
Amchem Products, Inc.: *See*—
Hall, Wilbur S., 4,578,419, Cl. 524-401.000.
Amdahl Corporation: *See*—
Amdahl, Gene M.; Lee, Hsiao-Peng S.; Rawlinson, Stephen J.; and Stuart, Stephen F., 4,578,750, Cl. 364-200.000.
Amdahl, Gene M.; Lee, Hsiao-Peng S.; Rawlinson, Stephen J.; and Stuart, Stephen F., to Amdahl Corporation. Code determination using half-adder based operand comparator. 4,578,750, Cl. 364-200.000.
American Cyanamid Company: *See*—
Carter, Guy T.; Borders, Donald B.; Goodman, Joseph J.; and Labeda, David P., 4,578,468, Cl. 546-35.000.
Quinlan, James M., 4,578,268, Cl. 424-79.000.
Singh, Balwant; and Waterman, Paul S., 4,578,513, Cl. 564-56.000.
American Hoechst Corporation: *See*—
Plazter, Stephan J. W., 4,578,156, Cl. 204-33.000.
American Home Products Corporation: *See*—
Mobilio, Dominick; Demerson, Christopher A.; and Humber, Leslie G., 4,578,398, Cl. 514-411.000.
American Hospital Supply Corporation: *See*—
Matier, William L., 4,578,403, Cl. 514-522.000.
Wilson, Bruce C., 4,577,543, Cl. 87-11.000.
American Multimedia, Inc.: *See*—
Farrow, Robert I., 4,578,644, Cl. 324-212.000.
American Standard Inc.: *See*—
Scott, Daniel G.; and Hill, Theodore B., 4,577,870, Cl. 277-1.000.
Worbois, Robert J., 4,577,910, Cl. 303-69.000.
American Sterilizer Company: *See*—
Klein, Roy S.; Gehly, Joel C.; and Sestak, Joseph T., 4,578,742, Cl. 362-294.000.
Silka, John L.; and Yeaney, Gerald L., 4,577,764, Cl. 211-41.000.
American Television & Communications Corporation: *See*—
Campbell, Wallace S., III, 4,578,702, Cl. 358-86.000.
AMF Inc.: *See*—
Hou, Kenneth C., 4,578,150, Cl. 162-164.300.
AMP Incorporated: *See*—
Coldren, Daniel R.; and Pritulsky, James, 4,577,920, Cl. 339-143.00R.
Look, Raymond J., 4,578,529, Cl. 174-117.0FF.
Waters, Mark H., 4,577,919, Cl. 339-59.00M.
Amundsen, Alan R.; and Stern, Eric W., to Engelhard Corporation. Ionic bis(dicarboxylato)palladate(II) anti-tumor agents. 4,578,490, Cl. 556-136.000.
Amundsen, Alan R.; and Stern, Eric W., to Engelhard Corporation. Bis(thiocyanato)palladium(II) complexes. 4,578,491, Cl. 556-137.000.
Analogic Corporation: *See*—
Crooke, Arthur W.; Gyles, Colin; and Stebbins, Edwin E., 4,578,640, Cl. 324-115.000.
Anchor Hocking Corporation: *See*—
Ochs, Charles S.; and Siler, Harold L., 4,578,001, Cl. 406-10.000.
Andersen, Per B.; and Richter, Ole J., to Myrens Verksted A/S. Fluid accumulator. 4,577,663, Cl. 138-31.000.
Anderson, Daniel J., to Emhart Industries, Inc. High voltage electrolite. 4,578,204, Cl. 252-62.200.
Anderson, James: *See*—
Hustad, Gerald O.; Griesbach, Ray H.; and Anderson, James, 4,577,757, Cl. 206-461.000.
Anderson, Russell Y., to Tektronix, Inc. Method of comparing data with asynchronous timebases. 4,578,666, Cl. 340-146.200.
Ando, Haruhisa: *See*—
Ozawa, Naoki; Akiyama, Toshiyuki; Nagahara, Shuusaku; Ohba, Shinya; Ando, Haruhisa; and Ozaki, Toshifumi, 4,578,707, Cl. 358-212.000.
Ando, Kazuo; and Matsuo, Yoshiaki. Die assembly for extruding multilayer parisons. 4,578,025, Cl. 425-133.100.
Ando, Mamoru: *See*—
Takano, Mitsuyoshi; and Ando, Mamoru, 4,578,638, Cl. 324-77.00B.
Ando, Masao, to Chisso Corporation. Series-connected, skin-current heating pipe including current trouble detector. 4,578,564, Cl. 219-301.000.
Andreas Stihl: *See*—
Gerhardy, Reinhard, 4,578,228, Cl. 261-41.00D.
Andriessen, Johannes; and Gaillard, Daniel, to Assistance Maintenance Construction Electrique. Device for supplying an electric receiver whose position on a surface is variable. 4,578,731, Cl. 361-42.000.
Anritsu Electric Co. Ltd.: *See*—
Takano, Mitsuyoshi; and Ando, Mamoru, 4,578,638, Cl. 324-77.00B.
Anselmo, Anthony G. Method and apparatus for making a color blended wall covering. 4,577,585, Cl. 118-50.000.
Ant Nachrichtentechnik GmbH: *See*—
Morz, Gunter, 4,578,679, Cl. 343-427.000.
Antula, Jovan. A. C. power converter. 4,578,744, Cl. 363-37.000.
Aoki, Hidehiko, to Kabushiki Kaisha Toshiba. Constant current source circuit. 4,578,633, Cl. 323-315.000.
Aoyagi, Masao; Kobayashi, Kazufumi; and Yasuda, Keiichi, to Canon Kabushiki Kaisha. Mechanical mounting for a zoom lens. 4,577,934, Cl. 350-430.000.
Aoyama, Keizo, to Fujitsu Limited. Semiconductor memory with load controlling feedback means to reduce power consumption. 4,578,778, Cl. 365-190.000.
Applied Materials, Inc.: *See*—
Aitken, Derek, 4,578,589, Cl. 250-492.200.
Arai, Fuminori; Inagaki, Yoshio; and Kitajima, Masao, to Fuji Photo Film Co., Ltd. Multilayer analytical element. 4,578,245, Cl. 422-56.000.
Arai, Katutoshi A.: *See*—
Kanamaru, Tatsuya; Nakayama, Motohiro; Ogawa, Yutaka; and Arai, Katutoshi A., 4,578,158, Cl. 204-44.200.
Arai, Tetsuji, to Ushio Denki Kabushiki Kaisha. Method for forming a single crystal silicon layer. 4,578,143, Cl. 156-617.00R.
Araki, Masatada: *See*—
Kuroyama, Yutaka; and Araki, Masatada, 4,578,260, Cl. 423-446.000.
Argon Medical Corp.: *See*—
Mueller, Richard L., Jr., 4,577,637, Cl. 128-658.000.
Ariizumi, Shoji; and Segawa, Makoto, to Tokyo Shibaura Denki Kabushiki Kaisha. Inverter circuit provided with gate protection. 4,578,694, Cl. 357-41.000.
Arimatsu, Keiji: *See*—
Tokuyama, Shunji; Suzuki, Kooji; Hirasawa, Kunio; Yoshioka, Yoshio; and Arimatsu, Keiji, 4,578,730, Cl. 361-4.000.
Ariniello, Susan E.: *See*—
Bray, Stuart W.; Hughes, Timothy C.; and Ariniello, Susan E., 4,577,811, Cl. 242-195.000.
Arita, Masafumi: *See*—
Tahara, Tetsuya; and Arita, Masafumi, 4,578,397, Cl. 514-411.000.
Arkell, James J.; and Hamlin, Robert N., to Minnesota Mining and Manufacturing Company. Intraocular lens with asymetric vaulted support loops. 4,578,078, Cl. 623-6.000.
Armand, Michel; Muller, Daniel; Duval, Michel; and Harvey, Paul-Etienne, to Societe Nationale Elf Aquitaine; and Hydro-Quebec. Novel macromolecular material for use in realizing electrolytes and/or electrodes. 4,578,326, Cl. 429-192.000.
Armenta, Richard D.; and Gibbons, Ian, to Syntex (U.S.A.) Inc. Immunoassays employing protected labels. 4,578,350, Cl. 435-7.000.
Armstrong, Thomas E.; Boob, Douglas L.; Burrous, Homer R.; Fryc, Oldrich; and Wagner, David L., to Boeing Company, The. Rivet injector/rejector device. 4,577,794, Cl. 227-119.000.
Arndts, Dietrich: *See*—
Stricker, Herbert; Freund, Bernhard; Harwalik, Heribert; Rominger, Karl L.; Darda, Siegfried; Haselbarth, Volkmar; Arndts, Dietrich; Bechtel, Wolf D.; Bozler, Gerhard; Brickl, Rolf; and Gruber, Peter, 4,578,264, Cl. 424-37.000.
Arnold, Fred E.: *See*—
Tsai, Tsu-Tzu; and Arnold, Fred E., 4,578,432, Cl. 525-432.000.
Tsai, Tsu-Tzu; and Arnold, Fred E., 4,578,434, Cl. 525-432.000.
Tsai, Tsu-Tzu; and Arnold, Fred E., 4,578,435, Cl. 525-432.000.
Arnold, Herbert; Horbelt, Michael; Seibel, Berthold; Strobele, Hans-Peter; and Werner, Peter, to Robert Bosch GmbH. Arrangement for controlling a fuel metering apparatus and having an emergency cotrol system. 4,577,605, Cl. 123-479.000.
Arp, Bradley W.; Lindberg, Ronald O. J.; and Mueller, Wayne A., to HEI, Inc. Multi-width card reader with cancellation feature. 4,578,569, Cl. 235-454.000.
Artaud, Robert; Aubert, Michel; and Renaux, Charley, to Commissariat a l'Energie Atomique. Fast neutron nuclear reactor. 4,578,238, Cl. 376-404.000.
Aruga, Masayoshi: *See*—
Kawata, Hiroitsu; Ohmura, Tadayoshi; Hasumi, Shunji; Konno, Yutaka; Aruga, Masayoshi; Tashiro, Seiki; Konno, Toshimitsu; and Iwai, Ken, 4,578,391, Cl. 514-256.000.
Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Niki, Akira; and Iwasaki, Hirofumi, 4,578,307, Cl. 428-288.000.
Asahi Kogaku Kogyo K.K.: *See*—
Morisawa, Tahei, 4,577,946, Cl. 354-152.000.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Urano, Fumio; Okura, Zenichi; and Kawasaki, Masahiro, 4,577,952, Cl. 354-455.000.
Asahikasei Kabushiki Kaisha: *See*—
Saito, Shigeakira; and Fukuoka, Masayuki, 4,578,327, Cl. 429-194.000.
Asai, Kuniaki: *See*—
Saito, Teruo; Asai, Kuniaki; and Hieda, Kazuo, 4,578,427, Cl. 525-150.000.
Asano, Hiroshi; Shimamune, Takayuki; and Hirao, Kazuhiro, to Permelec Electrode Ltd. Method for electrolyzing dilute caustic alkali aqueous solution by periodically reversing electrode polarities. 4,578,160, Cl. 204-98.000.
ASEA AB: *See*—
Lindstrom, Lars; and Nilsson, Kent, 4,578,562, Cl. 219-125.100.
Olsson, Karl-Erik, 4,578,745, Cl. 363-68.000.
ASEA Aktiebolag: *See*—
Bergstrom, Tommy; Boman, Goran; and Englund, Leif, 4,577,826, Cl. 248-638.000.
Ashikawa, Noboru, to Honda Giken Kogyo Kabushiki Kaisha. Four-wheel drive car. 4,577,721, Cl. 180-248.000.
Ashina, Yoshiro; Fujita, Takeyuki; Fukatsu, Michio; and Yagi, Junsuke, to Nitto Kagaku Kogyu Kabushiki Kaisha. Process for producing dimethylamine in preference to mono- or trimethylamine by vapor-

phase catalytic reaction of methanol and ammonia. 4,578,516, Cl. 564-479.000.
Ashland Oil, Inc.: *See*—
Goel, Anil B., 4,578,424, Cl. 525-109.000.
Aso, Shigeru: *See*—
Hayashi, Masanori; Sakurai, Akira; and Aso, Shigeru, 4,577,976, Cl. 374-29.000.
Assaf, Gad, to Solmat Systems Ltd. Method of and apparatus for dynamically stabilizing the wind-mixed layer of a solar-water pond. 4,577,618, Cl. 126-415.000.
Assarsson, Per G.; and Nagasuye, Joseph H., to St. Lawrence Reactors Limited. Fermentation of glucose with recycle of non-fermented components. 4,578,353, Cl. 435-161.000.
Assistance Maintenance Construction Electrique: *See*—
Andriessen, Johannes; and Gaillard, Daniel, 4,578,731, Cl. 361-42.000.
Assmann, Helmut; Dichtjar, Gerhard; Dorr, Wolfgang; Maier, Georg; Mathieu, Viktor; and Peehs, Martin, to Kraftwerk Union Aktiengesellschaft. Method for the manufacture of oxidic sintered nuclear fuel bodies. 4,578,229, Cl. 264-0.500.
Astley, Vivian C.; Milan, Rudolph R.; and Taravella, Jody J., to Freeport Minerals Company. Wet grinding phosphate rock in an acidic slurry. 4,577,804, Cl. 241-16.000.
Astronics Corporation: *See*—
Kerr, Charles, III; and Forell, Mark, 4,578,617, Cl. 313-512.000.
AT&T Bell Laboratories: *See*—
Borg, Kevin E.; Halas, William P.; Mattes, Hans G.; McLear, Paul M.; and White, Lester L., 4,578,540, Cl. 179-2.00A.
Everhart, Joseph R.; and Osborn, Jeffrey G., 4,578,531, Cl. 178-22.080.
Gharavi, Hamid, 4,578,704, Cl. 358-135.000.
Gossard, Arthur C.; Miller, Robert C.; and Petroff, Pierre M., 4,578,127, Cl. 148-175.000.
Gray, Michael A., 4,578,761, Cl. 364-481.000.
Grosch, James T., 4,578,630, Cl. 323-271.000.
AT&T Information Systems Inc.: *See*—
Charalambous, Salomi T.; Horvath, Mark P.; House, Cathy P.; Iapicco, Jeffrey A.; Lue, Paul D.; and Verma, Shiv P., 4,578,796, Cl. 375-8.000.
AT&T Technologies, Inc.: *See*—
Brown, Donald R., 4,578,736, Cl. 361-306.000.
Clark, Harold R.; and Nicol, David A., 4,578,101, Cl. 65-109.000.
Erwin, Edward A., 4,578,751, Cl. 364-200.000.
Gill, Roger F.; and Narasimham, Pundi L., 4,578,253, Cl. 423-87.000.
Paek, Un C.; and Schroeder, Charles M., 4,578,098, Cl. 65-13.000.
Atalla Corporation: *See*—
Atalla, Martin M., 4,577,779, Cl. 221-1.000.
Atalla, Martin M., to Atalla Corporation. Currency-dispensing method and apparatus. 4,577,779, Cl. 221-1.000.
Atlantic Richfield Company: *See*—
Melpolder, Frank W., 4,578,357, Cl. 436-39.000.
Aubert, Michel: *See*—
Artaud, Robert; Aubert, Michel; and Renaux, Charley, 4,578,238, Cl. 376-404.000.
Auer, William F. Gathering and storing device for electric cable. 4,577,809, Cl. 242-96.000.
Auergesellschaft GmbH: *See*—
Hoffmann, Wilfried, 4,577,348, Cl. 2-84.000.
Aumann, James T., to Norton Christensen, Inc. Bearing system for a downhole motor. 4,577,704, Cl. 175-107.000.
Aumueller, Alexander: *See*—
Huenig, Siegfried; and Aumueller, Alexander, 4,578,220, Cl. 260-239.00R.
Ausnit, Steven, to Minigrip Incorporated. Bag and reclosable separable fastener assembly providing both closing alignment facility and differential separation resistance. 4,578,813, Cl. 383-65.000.
Autoflug GmbH: *See*—
Harenberg, Holger, 4,577,378, Cl. 24-635.000.
Automotive Engine Associates: *See*—
Showalter, Merle R., 4,577,602, Cl. 123-306.000.
Automotive Products plc: *See*—
Frank, Charles A.; and Compton, David J., 4,577,549, Cl. 92-169.000.
Autosystems Limited: *See*—
Brook, Richard M., 4,577,708, Cl. 177-145.000.
Avery International Corporation: *See*—
Lare, Donald W.; and Van Nguyen, Thanh, 4,578,288, Cl. 427-365.000.
AVG Productions, Inc.: *See*—
Franke, John M., Sr., 4,577,792, Cl. 226-162.000.
Aviram, Ari; Dove, Derek B.; and Lane, Ramon, to International Business Machines Corporation. Color-on-demand ribbon printing. 4,577,983, Cl. 400-120.000.
Awa, Masashi: *See*—
Ito, Takeo; Ido, Tadashi; Takeuchi, Hajime; Hashimoto, Minoru; Maeda, Tatsumi; and Awa, Masashi, 4,578,313, Cl. 428-403.000.
B. F. Goodrich Company, The: *See*—
Kramer, James H., 4,577,379, Cl. 29-149.50S.
Baba, Fumio, to Fujitsu Limited. Dual port type semiconductor memory. 4,578,780, Cl. 365-190.000.
Baba, Hidetoshi: *See*—
Tanaka, Hiroshi; and Baba, Hidetoshi, 4,578,087, Cl. 51-295.000.
Baba, Kiyokazu, to Kabushiki Kaisha Komatsu Seisakusho. Retracting mechanism and jaw assembly for a power press. 4,577,486, Cl. 72-421.000.
Baba, Tadashi: *See*—
Shibata, Yuichi; and Baba, Tadashi, 4,578,034, Cl. 433-29.000.
Babcock & Wilcox Company, The: *See*—
Ciammaichella, Richard C.; and Youmans, Barry J., 4,578,583, Cl. 250-339.000.
Bachmann, Bernd; Kuss, Peter; Schuhmann, Frank; and Wollner, Jurgen, to VEB Kombinat Textima. Method and apparatus for the positioning of textile surface configurations. 4,577,854, Cl. 271-227.000.
Backes, Reiner: *See*—
Elmis, Herbert; and Backes, Reiner, 4,578,705, Cl. 358-148.000.
Bacskai, Laszlo: *See*—
Csizer, Zoltan; Sikos, Karoly; Bacskai, Laszlo; Joo, Istvan; Niedermayer, Eleonora; Rethy, Lajos; and Zsidai, Jozsef, 4,578,270, Cl. 424-92.000.
Badiali, Roberto: *See*—
Speranzin, Claudio; Badiali, Roberto; and Bertoli, Luciano, 4,577,459, Cl. 57-22.000.
Baglioni, Alessandro, to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A.; and Medosan Industrie Biochimie Riunite S.p.A. Pyrrolacetic amides having antiinflammatory activity. 4,578,481, Cl. 548-539.000.
Bahrmann, Helmut; Cornils, Boy; Konkol, Werner; and Lipps, Wolfgang, to Ruhrchemie Aktiengesellschaft. Process for the preparation of aldehydes. 4,578,523, Cl. 568-454.000.
Bailer, Norbert: *See*—
Lenard, Peter; Pokorny, Erich; and Bailer, Norbert, 4,577,533, Cl. 76-41.000.
Bain, Brian M.: *See*—
Phillipps, Gordon H.; Bain, Brian M.; and Laing, Stuart B., 4,578,221, Cl. 260-397.100.
Bain, James M.: *See*—
Hamisch, Paul H., Jr.; Vanderpool, James L.; and Bain, James M., 4,578,138, Cl. 156-361.000.
Bake, Earl A.; and Hartle, Clair W., Jr., to Rockwell International Corporation. Valve stem seal with multiple ring means. 4,577,872, Cl. 277-12.000.
Baker, David C.; Bantz, David F.; and Flurry, Gregory A., to International Business Machines Corporation. Method and apparatus for wireless cursor position control. 4,578,674, Cl. 340-710.000.
Baker Oil Tools, Inc.: *See*—
Brakhage, William L., Jr., 4,577,694, Cl. 166-382.000.
Bakke, David C.: *See*—
Bakke, John S.; and Bakke, David C., 4,578,636, Cl. 324-66.000.
Bakke, John S.; and Bakke, David C. Apparatus for identifying wires of multiple wire electrical system. 4,578,636, Cl. 324-66.000.
Baldarelli Bros., Inc.: *See*—
Baldarelli, Wallace E.; and Grenier, Wilfred J., 4,578,015, Cl. 414-513.000.
Baldarelli, Wallace E.; and Grenier, Wilfred J., to Baldarelli Bros., Inc. Truck body with pull-off door. 4,578,015, Cl. 414-513.000.
Ball Corporation: *See*—
Nguyen, Tuan A., 4,577,774, Cl. 220-66.000.
Balle , Gerhard: *See*—
Rasshofer, Werner; and Balle , Gerhard, 4,578,500, Cl. 560-25.000.
Bamer, Franz, to Robert Bosch GmbH. Apparatus for shielding and protecting an air flow rate meter disposed in the intake tube of an internal combustion engine from air column fluctuations. 4,577,495, Cl. 73-118.000.
Bangerter, Blauer L.; and Streeter, James M., to Brigham Young University. Exercise machine for limb extremity digits. 4,577,861, Cl. 272-96.000.
Banike, Ronald, to R. R. Donnelley & Sons Company. Gapless lock-up for offset printing cylinders. 4,577,560, Cl. 101-415.100.
Bansemir, Horst: *See*—
Bongers, Bernd; and Bansemir, Horst, 4,577,736, Cl. 188-371.000.
Bantz, David F.: *See*—
Baker, David C.; Bantz, David F.; and Flurry, Gregory A., 4,578,674, Cl. 340-710.000.
Bardin, Roland; Bernard, Jean; Peyre, Henri; and Viodet, Patrice, to Ste Look. Safety ski binding. 4,577,887, Cl. 280-628.000.
Barfurth, Dieter; and Nestler, Heinz, to Dynamit Nobel Aktiengesellschaft. Binding agents containing titanic acid esters for the preparation of coating compositions and refractory bodies, and a method for the preparation of these binding agents. 4,578,487, Cl. 556-40.000.
Barillec, Christian; Janvier, Dominique; and Bonneton, Marc, to Societe Anonyme Redoute Catalogue. Device for picking up loose articles. 4,578,013, Cl. 414-323.000.
Barker, John C., to Cambridge Instruments Limited. Image comparison systems. 4,578,765, Cl. 364-514.000.
Barnea, Daniel I.: *See*—
Crawford, Carl R.; Shimoni, Yair; Sohval, A. Robert; and Barnea, Daniel I., 4,578,753, Cl. 364-414.000.
Barr, John D., to NL Petroleum Products Limited. Rotary drill bits. 4,577,706, Cl. 175-329.000.
Barth, Hubert: *See*—
Satzinger, Gerhard; Barth, Hubert; Hartenstein, Johannes; Herrmann, Manfred; Fritschi, Edgar; and Schutt, Ilse-Dore, 4,578,380, Cl. 514-232.000.
Bartlett, Brian E.; Harris, James E.; and Wilkes, John G., to U.S. Philips Corporation. Method of making monocrystalline ternary semiconductor compounds. 4,578,145, Cl. 156-616.00R.
Bartos, Frank J.: *See*—
Gosis, Anatoly I.; and Bartos, Frank J., 4,578,585, Cl. 250-363.00S.
Bartos, Josef. Hydraulic motor. 4,578,020, Cl. 418-196.000.

BASF Aktiengesellschaft: *See—*
Boehm, Udo; Grittmann, Ernst-Juergen; and Schulze-Berge, Klaus, 4,578,726, Cl. 360-99.000.
Frickel, Fritz-Frieder; and Nuerrenbach, Axel, 4,578,498, Cl. 560-8.000.
Huenig, Siegfried; and Aumueller, Alexander, 4,578,220, Cl. 260-239.00R.
Lenz, Werner; Sander, Hans; and Moeller, Dieter, 4,578,426, Cl. 525-131.000.
Muenstedt, Helmut; and Naarmann, Herbert, 4,578,433, Cl. 525-417.000.
Pipper, Gunter; Riegger, Siegfried; and Floss, Josef G., 4,578,455, Cl. 528-501.000.

Battelle Memorial Institute: *See—*
Giddey, Claude; and Dove, Georges, 4,578,278, Cl. 426-605.000.

Batz, Hans-Georg: *See—*
Siedel, Joachim; Neumann, Ulrich; Ziegenhorn, Joachim; Batz, Hans-Georg; Lenz, Helmut; Pautz, Brigitte; and Albert, Winfried, 4,578,361, Cl. 436-547.000.

Bauch, Ernst, to Neumuenstersche Maschinen- und Apparatebau Gesellschaft mbH (NEUMAG). Staple fiber cutting machine. 4,577,537, Cl. 83-343.000.

Baumann, Hans D. Dual valve stem packing arrangement. 4,577,873, Cl. 277-110.000.

Baumann, Thomas; Dacol, Frank H.; and Melcher, Robert L., to International Business Machines Corporation. Thermal wave microscopy using areal infrared detection. 4,578,584, Cl. 250-341.000.

Bay Mills Limited: *See—*
Gidge, Lester; and Murro, Ronald P., 4,578,141, Cl. 156-439.000.

Bayer Aktiengesellschaft: *See—*
Jager, Gerhard; Bockmann, Klaus; Buchel, Karl H.; Brandes, Wilhelm; Frohberger, Paul-Ernst; and Scheinpflug, Hans, 4,578,396, Cl. 514-383.000.
Jager, Horst, 4,578,461, Cl. 544-76.000.
Molteni, Emanuele, 4,578,231, Cl. 264-25.000.
Rasshofer, Werner; and Balle , Gerhard, 4,578,500, Cl. 560-25.000.
Schmidt, Manfred; and Meyer, Karl-Heinrich, 4,578,476, Cl. 548-144.000.

Bayer, Arthur C.; Robbins, Jeffrey D.; and Bowler, Donald J., to Stauffer Chemical Company. Method for preparation of salts of N-phosphonomethylglycine. 4,578,224, Cl. 260-502.50F.

Bayerl, Eugen: *See—*
Grosser, Siegfried; Ludwig, Christian; Wallner, Kurt; Herzog, Karl; and Bayerl, Eugen, 4,577,944, Cl. 352-35.000.

Bayle-Laboure, Gerard J. P.; Bouiller, Jean G.; Buisson, Marc F. B.; and Soligny, Marcel R., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.". Variable section nozzle for a turbo-jet engine and an aircraft comprising such equipment. 4,577,814, Cl. 244-12.500.

Bearden, Roby, Jr.; and Aldridge, Clyde L., to Exxon Research and Engineering Co. Catalysts and hydroconversion processes utilizing the same. 4,578,182, Cl. 208-112.000.

Beattie Systems, Inc.: *See—*
Fox, Anthony G.; Smith, Harry L. O.; and Sadre-Marandi, Ehsan, 4,577,947, Cl. 354-275.000.

Beauchamp, William T.: *See—*
Rancourt, James D.; and Beauchamp, William T., 4,578,527, Cl. 136-256.000.

Beaussant, Raymond, to Intertechnique. Quick attachment device for harness of a piece of equipment. 4,577,375, Cl. 24-580.000.

Bechtel, Wolf D.: *See—*
Stricker, Herbert; Freund, Bernhard; Harwalik, Heribert; Rominger, Karl L.; Darda, Siegfried; Haselbarth, Volkmar; Arndts, Dietrich; Bechtel, Wolf D.; Bozler, Gerhard; Brickl, Rolf; and Gruber, Peter, 4,578,264, Cl. 424-37.000.

Becton, Dickinson and Co.: *See—*
Nitzsche, Raymond P.; and Geiger, Kenneth E., 4,577,630, Cl. 128-314.000.

Beecham Group p.l.c.: *See—*
Markwell, Roger E.; and Smith, Stephen A., 4,578,393, Cl. 514-310.000.

Beesley, Robert S.; and Feichko, Joe. Welding jig. 4,577,383, Cl. 29-281.100.

Behrens, Klaus: *See—*
Harder, Hans E.; Behrens, Klaus; and Kotz, Rainer, 4,578,081, Cl. 623-22.000.

Behringer, Uwe; Bohlen, Harald; Nehmiz, Peter; and Zapka, Werner, to International Business Machines Corporation. Error-corrected corpuscular beam lithography. 4,578,587, Cl. 250-492.200.

BEI Electronics, Inc.: *See—*
Perry, John W., 4,577,561, Cl. 102-215.000.

Beitler, Franz, to U.S. Philips Corporation. Tape cassette holder with releasable reel hold-down. 4,578,724, Cl. 360-85.000.

Belcher, John R.: *See—*
Mayer, John F.; Langdon, Nick H.; Cook, Stuart A.; Nicholson, L. Todd; and Belcher, John R., 4,578,045, Cl. 446-330.000.

Bell & Howell Company: *See—*
Hams, Kenneth A., 4,577,848, Cl. 270-55.000.
Parker, Robert R.; and Rattan, Dev R., 4,578,718, Cl. 360-10.300.

Bell Telephone Laboratories, Incorporated: *See—*
Charalambous, Salomi T.; Horvath, Mark P.; House, Cathy P.; Iapicco, Jeffrey A.; Lue, Paul D.; and Verma, Shiv P., 4,578,796, Cl. 375-8.000.

Bellanca, Guido. Fettuccine cooking apparatus. 4,577,551, Cl. 99-348.000.

Bellussi, Giuseppe: *See—*
Buonomo, Franco; Bellussi, Giuseppe; and Notari, Bruno, 4,578,161, Cl. 204-102.000.

Beloit Corporation: *See—*
Peel, John D.; and Knight, Paul A., 4,578,199, Cl. 210-788.000.

Belouet, Christian: *See—*
Mautref, Michel; and Belouet, Christian, 4,577,588, Cl. 118-665.000.

Beltran, Jose M. F. Valve. 4,577,656, Cl. 137-375.000.

Bender, Heinrich: *See—*
Reinartz, Dieter; Bender, Heinrich; and Laurent, Gunter, 4,578,194, Cl. 210-673.000.

Benge, Herman: *See—*
Bradley, Charles A.; Benge, Herman; Parl, Fritz F.; and Seebaugh, William R., 4,577,514, Cl. 73-863.010.

Bennardo, Gilbert, to S.A.M. Microtechnic. Impregnable locking system. 4,577,750, Cl. 206-1.500.

Bennett, Richard C. Self-balancing boom apparatus. 4,577,819, Cl. 248-123.100.

Beranek, William J., to Cordis Corporation. Movable multi-contact electromechanical connection. 4,577,643, Cl. 128-785.000.

Berfield, Robert C.: *See—*
Miller, Jonathan; Berfield, Robert C.; and Crevling, Robert L., Jr., 4,577,366, Cl. 15-388.000.

Berg, Marvin; and Grachek, Bruce. Locking mechanism for extendible telescoping tubular members. 4,577,837, Cl. 254-212.000.

Bergles, Eduard, to Fichtel & Sachs AG. Multi-ratio drive hub for bicycles with at least three different drive torque paths. 4,577,531, Cl. 74-781.00B.

Bergstrom, Tommy; Boman, Goran; and Englund, Leif, to ASEA Aktiebolag. Stand structure for supporting electric high voltage equipment. 4,577,826, Cl. 248-638.000.

Bergwerksverband GmbH: *See—*
Richter, Ekkehard; Korbacher, Werner; Knoblauch, Karl; Giessler, Klaus; and Harder, Klaus-Burkhard, 4,578,089, Cl. 55-26.000.

Berkey, George E., to Corning Glass Works. Method of forming a polarization preserving optical waveguide. 4,578,097, Cl. 65-3.110.

Berkovits, Barouh V.; Waxman, Menashe B.; and Combs, William J., to Medtronic, Inc. Rate scanning demand pacemaker and method for treatment of tachycardia. 4,577,633, Cl. 128-419.0PG.

Berman, James. Teller machine enclosure. 4,577,562, Cl. 109-24.100.

Bernard, Jean: *See—*
Bardin, Roland; Bernard, Jean; Peyre, Henri; and Viodet, Patrice, 4,577,887, Cl. 280-628.000.

Bertoli, Luciano: *See—*
Speranzin, Claudio; Badiali, Roberto; and Bertoli, Luciano, 4,577,459, Cl. 57-22.000.

Best, Steven A., to Exxon Research & Engineering Co. Polymerization catalyst, production and use. 4,578,374, Cl. 502-115.000.

Beth Israel Hospital Association, The: *See—*
Spears, J. Richard, 4,577,636, Cl. 128-654.000.

Betts, Alan J.; and Elliott, Peter J., to International Business Machines Corporation. Head positioning system with automatic gain control. 4,578,723, Cl. 360-77.000.

Betz Laboratories, Inc.: *See—*
Forester, David R., 4,578,178, Cl. 208-48.0AA.
Merrell, Gene A., 4,577,566, Cl. 110-343.000.

Beyer, Lewis R. Ring binder. 4,577,985, Cl. 402-22.000.

Bianco, Eric L. Theft prevention apparatus for shopping carts. 4,577,880, Cl. 280-33.99C.

Bigliardi, Juan B. Collapsible containers. 4,577,772, Cl. 220-1.500.

Bingaman, Barrett P.; Krum, Richard G.; and Williams, James R., to Cetec Corporation. Tape loop bin control system. 4,577,790, Cl. 226-118.000.

Biofusion, Inc.: *See—*
Schoner, Wolfgang, 4,578,167, Cl. 204-183.100.

Biomedical Concepts, Inc.: *See—*
Graham, John R., 4,577,638, Cl. 128-671.000.

Biorcio, Luciano; and Mensi, Carlo, to P. D. George Co., The; and Industrie Vernici Italiane S.p.A. Phenoxy resins and use thereof in electric insulation. 4,578,312, Cl. 428-336.000.

Biotronics: *See—*
Hofmann, Gunter A., 4,578,168, Cl. 204-299.00R.

Birch, William A.; and Woodard, Lillie M., to Motorola, Inc. Flip-flop having improved synchronous reset. 4,578,599, Cl. 307-272.00A.

Birkenbach, Alfred: *See—*
Burgdorf, Jochen; Birkenbach, Alfred; and Klimt, Ulrich, 4,577,731, Cl. 188-73.330.

Bitel, Vincent J., to Rogers Manufacturing Co., The. Utility box. 4,577,773, Cl. 220-22.300.

BL Technology Limited: *See—*
Bray, David J.; Johnson, Peter E.; Marshall, Peter E. G.; Piper, Francis R.; and Murdoch, Iain H., 4,577,490, Cl. 73-40.700.
Marshall, Peter E. G.; Piper, Francis R.; and Wilson, John F., 4,577,489, Cl. 73-40.700.

Blackaby, Dale W. Theatrical risers. 4,577,856, Cl. 272-25.000.

Blackstone, Scott C.: *See—*
Corboy, John F., Jr.; Jastrzebski, Lubomir L.; Blackstone, Scott C.; and Pagliaro, Robert H., Jr., 4,578,142, Cl. 156-612.000.

Blatner, John R., to Hydraulic Servocontrols Corporation. Nozzle and impingement plate valve. 4,577,652, Cl. 137-82.000.

Blum, Alex: *See—*
Suter, Heinz; and Blum, Alex, 4,578,659, Cl. 335-131.000.

Bobik, Carl F.: *See—*
Huseby, Irvin C.; and Bobik, Carl F., 4,578,232, Cl. 264-65.000.
Huseby, Irvin C.; and Bobik, Carl F., 4,578,233, Cl. 264-65.000.

Huseby, Irvin C.; and Bobik, Carl F., 4,578,234, Cl. 264-65.000.
Huseby, Irvin C.; and Bobik, Carl F., 4,578,364, Cl. 501-98.000.
Huseby, Irvin C.; and Bobik, Carl F., 4,578,365, Cl. 501-98.000.

BOC Group, plc, The: *See—*
Moore, Colin; and Jenkins, David P., 4,577,567, Cl. 110-347.000.

Bockmann, Klaus: *See—*
Jager, Gerhard; Bockmann, Klaus; Buchel, Karl H.; Brandes, Wilhelm; Frohberger, Paul-Ernst; and Scheinpflug, Hans, 4,578,396, Cl. 514-383.000.

Boegner, Gregory J.; Walters, Harry J.; and Marshner, Robert L., to M. S. Willett, Inc. Press mounted transfer apparatus. 4,577,748, Cl. 198-621.000.

Boehm, Udo; Grittmann, Ernst-Juergen; and Schulze-Berge, Klaus, to BASF Aktiengesellschaft. Head arm mounting device for one or more scanning heads in recording playback apparatus for disk records. 4,578,726, Cl. 360-99.000.

Boehringer Ingelheim GmbH: *See—*
Stricker, Herbert; Freund, Bernhard; Harwalik, Heribert; Rominger, Karl L.; Darda, Siegfried; Haselbarth, Volkmar; Arndts, Dietrich; Bechtel, Wolf D.; Bozler, Gerhard; Brickl, Rolf; and Gruber, Peter, 4,578,264, Cl. 424-37.000.

Boehringer Mannheim GmbH: *See—*
Siedel, Joachim; Neumann, Ulrich; Ziegenhorn, Joachim; Batz, Hans-Georg; Lenz, Helmut; Pautz, Brigitte; and Albert, Winfried, 4,578,361, Cl. 436-547.000.
van Rijckevorsel, Rainer; Kasielke, Joachim; Macho, Heinz; Schafer, Peter; and Nenninger, Klaus, 4,578,716, Cl. 360-1.000.

Boeing Company, The: *See—*
Armstrong, Thomas E.; Boob, Douglas L.; Burrous, Homer R.; Fryc, Oldrich; and Wagner, David L., 4,577,794, Cl. 227-119.000.
Large, David T., 4,577,450, Cl. 52-787.000.
Pinson, George T., 4,577,825, Cl. 248-550.000.
Russnak, Clarence J., 4,577,965, Cl. 356-138.000.
Williams, John W., 4,577,579, Cl. 114-274.000.

Boge GmbH: *See—*
Meller, Theo; Knecht, Heinz; and Kuchheuser, Werner, 4,577,840, Cl. 267-64.170.
Moser, Bernd, 4,577,509, Cl. 73-658.000.

Bogese, Stephen B., II, to Virginia Patent Development Corp. Modular connector with improved housing and contact structure. 4,577,921, Cl. 339-176.00M.

Bohlen, Harald: *See—*
Behringer, Uwe; Bohlen, Harald; Nehmiz, Peter; and Zapka, Werner, 4,578,587, Cl. 250-492.200.

Bohringer, Wilfried; Eheim, Franz, deceased (by Eheim, Helga, legal representative); Fehlmann, Wolfgang; Laufer, Helmut; and Zibold, Karl, to Robert Bosch GmbH. Pressure valve assembly for fuel injection pumps. 4,577,606, Cl. 123-506.000.

Boire, Daniel C.: *See—*
Degenford, James E.; and Boire, Daniel C., 4,578,629, Cl. 323-217.000.

Bolieau, Christopher W., to Morton Thiokol, Inc. Minimum bulk, light weight welded aluminum inflator. 4,578,247, Cl. 422-165.000.

Bom, Cornelis J. G.: *See—*
van der Lely, Ary; and Bom, Cornelis J. G., 4,577,456, Cl. 56-13.600.

Boman, Goran: *See—*
Bergstrom, Tommy; Boman, Goran; and Englund, Leif, 4,577,826, Cl. 248-638.000.

Bonacchi, Graziano; Fedi, Mauro; and Giannini, Mario, to Malesci S.p.A. Instituto Farmacobiologico. Process for the preparation of 1-pyridyl-alkyl-4-aryl piperazines which are useful as antihypertensive compounds, their separation into the respective optical antipodes, and the stereoisomeric compounds so obtained. 4,578,467, Cl. 544-360.000.

Bonacci, Carlo, to Societa Italiana Vetro SIV S.p.A. Apparatus for cutting sheets of plate glass according to a programmed profile. 4,577,539, Cl. 83-886.000.

Bongers, Bernd; and Bansemir, Horst, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Tubular member, especially for a safety steering column for motor vehicles. 4,577,736, Cl. 188-371.000.

Bonino, Pierre; Ducret, Christian; and Mazzoleni, Cyrille, to Compagnie Parisienne d'Outillage a Air Comprime. Connecting clamp for pneumatic apparatus. 4,577,893, Cl. 285-158.000.

Bonneton, Marc: *See—*
Barillec, Christian; Janvier, Dominique; and Bonneton, Marc, 4,578,013, Cl. 414-323.000.

Boob, Douglas L.: *See—*
Armstrong, Thomas E.; Boob, Douglas L.; Burrous, Homer R.; Fryc, Oldrich; and Wagner, David L., 4,577,794, Cl. 227-119.000.

Borders, Donald B.: *See—*
Carter, Guy T.; Borders, Donald B.; Goodman, Joseph J.; and Labeda, David P., 4,578,468, Cl. 546-35.000.

Borg, Kevin E.; Halas, William P.; Mattes, Hans G.; McLear, Paul M.; and White, Lester L., to AT&T Bell Laboratories. Telecommunications systems. 4,578,540, Cl. 179-2.00A.

Borg-Warner Corporation: *See—*
Gray, Stanley J., 4,578,006, Cl. 409-303.000.

Borja, Antonio B. Multi-chambered air cleaner. 4,578,091, Cl. 55-90.000.

Bormioli, Giorgio. Hose fitting with automatic separation under strong tensile stress. 4,577,833, Cl. 251-149.100.

Borregaard Industries Limited: *See—*
Skattebol, Lars; and Stenstrom, Yngve, 4,578,484, Cl. 549-360.000.

Borrman, Bo; Hellman, Erik; Lundin, Nils; and Ode, Bengt, to AB ASEA-ATOM. Earthquake-proof fuel assembly. 4,578,241, Cl. 376-446.000.

Borsenberger, Paul M.; Regan, Michael T.; and Staudenmayer, William J., to Eastman Kodak Company. Multi-active photoconductive insulating elements and method for their manufacture. 4,578,334, Cl. 430-59.000.

Borsenberger, Paul M.: *See—*
Staudenmayer, William J.; Chen, Tsang J.; Borsenberger, Paul M.; and Grashof, Hans R., 4,578,333, Cl. 430-60.000.

Borsh, Richard J.; Ripley, Robert W.; and Pate, Harold T., to Thyssen-Bornemisza, Inc., (TBG Inc.). Electrical outlet box and method of manufacturing same. 4,578,528, Cl. 174-65.00G.

Bosch, Henery G. K.; and Pouliot, Thomas W. Self adjusting camshaft gear for internal combustion engines. 4,577,592, Cl. 123-90.150.

Boschung, Andre : *See—*
Morris, Anthony F.; Delay, Francois; Gautschi, Fritz; Thomas, Alan F.; Giersch, Wolfgang K.; and Boschung, Andre , 4,578,277, Cl. 426-538.000.

Bosteels, Michel; and Oliva, Ambro. Calibrated fluid flow control device. 4,577,658, Cl. 137-599.000.

Boston, William G.: *See—*
Dellinger, Thomas B.; Boston, William G.; Sexton, James H.; and Strong, Robert T., 4,577,700, Cl. 175-40.000.

Bott, David C.; Edwards, John H.; and Feast, William J., to British Petroleum Company P.L.C., The. Polyacetylene production. 4,578,443, Cl. 526-285.000.

Boucher, William R.: *See—*
Cloutier, Frank L.; McClelland, Paul H.; Boucher, William R.; and Siewell, Gary L., 4,578,687, Cl. 346-140.00R.

Bouiller, Jean G.: *See—*
Bayle-Laboure, Gerard J. P.; Bouiller, Jean G.; Buisson, Marc F. B.; and Soligny, Marcel R., 4,577,814, Cl. 244-12.500.

Bowen, John G. Soft contact lens disinfecting unit. 4,578,566, Cl. 219-521.000.

Bowler, Donald J.: *See—*
Bayer, Arthur C.; Robbins, Jeffrey D.; and Bowler, Donald J., 4,578,224, Cl. 260-502.50F.

Bowman, Edward E.: *See—*
Ibrahim, Fayez F.; and Bowman, Edward E., 4,577,467, Cl. 62-82.000.

Boyett, Gladys D. Removable book marker strip. 4,577,890, Cl. 281-29.000.

Bozler, Gerhard: *See—*
Stricker, Herbert; Freund, Bernhard; Harwalik, Heribert; Rominger, Karl L.; Darda, Siegfried; Haselbarth, Volkmar; Arndts, Dietrich; Bechtel, Wolf D.; Bozler, Gerhard; Brickl, Rolf; and Gruber, Peter, 4,578,264, Cl. 424-37.000.

Brackett, John E.; and Dahlberg, Larry J., to Fishing Designs, Inc. Fishing rod handle. 4,577,432, Cl. 43-23.000.

Bradley, Charles A.; Benge, Herman; Parl, Fritz F.; and Seebaugh, William R., to Vanderbilt University. Method and apparatus for sampling liquid phase components from a liquid-semisolid fluid. 4,577,514, Cl. 73-863.010.

Bradley, Robert F., to Micro-Circuits Company. Electrical conductivity-enhancing and protecting material. 4,578,215, Cl. 252-514.000.

Brakhage, William L., Jr., to Baker Oil Tools, Inc. Permanent lock open tool. 4,577,694, Cl. 166-382.000.

Brandes, Wilhelm: *See—*
Jager, Gerhard; Bockmann, Klaus; Buchel, Karl H.; Brandes, Wilhelm; Frohberger, Paul-Ernst; and Scheinpflug, Hans, 4,578,396, Cl. 514-383.000.

Brannan, William L., Jr., to Seagate Technology. Stress test for magnetic disc recording apparatus. 4,578,721, Cl. 360-51.000.

Braud, Yves; and Fromentin, Jean, to Stein Heurtey Ste Anonyme. Device for charging steel products in a reheating or treatment furnace. 4,578,011, Cl. 414-152.000.

Braude, Ruvim, to Burroughs Corporation. Glass composition and gas-filled display panel incorporating the glass. 4,578,619, Cl. 313-586.000.

Braun, Otto P. Apparatus for controlling the regulator of a device for spreading salt or the like on roads. 4,577,781, Cl. 222-54.000.

Braun, Ralph V.: *See—*
Whitehead, Howard A.; and Braun, Ralph V., 4,578,069, Cl. 604-370.000.

Bray, David J.; Johnson, Peter E.; Marshall, Peter E. G.; Piper, Francis R.; and Murdoch, Iain H., to BL Technology Limited. Detecting leaks. 4,577,490, Cl. 73-40.700.

Bray, Stuart W.; Hughes, Timothy C.; and Ariniello, Susan E., to Storage Technology Corporation. Tape reel position sensor. 4,577,811, Cl. 242-195.000.

Breininger, J. Shannon, to PPG Industries, Inc. Method of making non-glare coated glass. 4,578,100, Cl. 65-60.800.

Brenner, Peter, to Georg Fischer Aktiengesellschaft. Multiple-station centrifugal blasting apparatus. 4,577,441, Cl. 51-419.000.

Bressan, Elie: *See—*
Urien, Jacques; Bressan, Elie; Danguy, Jacques; and Narzul, Marcel, 4,578,658, Cl. 333-227.00.

Breu, Johann, to Rockinger Spezialfabrik fur Anhangerkupplungen GmbH & Co. Trailer coupling. 4,577,885, Cl. 280-508.000.

Brickl, Rolf: *See—*
Stricker, Herbert; Freund, Bernhard; Harwalik, Heribert; Rominger, Karl L.; Darda, Siegfried; Haselbarth, Volkmar; Arndts, Dietrich; Bechtel, Wolf D.; Bozler, Gerhard; Brickl, Rolf; and Gruber, Peter, 4,578,264, Cl. 424-37.000.

Bricmont, Francis H. Method for joining together heated workpieces for processing in a rolling mill. 4,577,384, Cl. 29-460.000.
Brigham and Women's Hospital: *See*—
Pier, Gerald B., 4,578,458, Cl. 536-123.000.
Brigham Young University: *See*—
Bangerter, Blauer L.; and Streeter, James M., 4,577,861, Cl. 272-96.000.
Brinkman, Winford L. Promotional game. 4,577,869, Cl. 273-269.000.
Bristol-Myers Company: *See*—
Crenshaw, Ronnie R.; and Algieri, Aldo A., 4,578,471, Cl. 546-193.000.
British-American Tobacco Company Limited: *See*—
Luke, John A., 4,578,053, Cl. 493-45.000.
British Petroleum Company P.L.C., The: *See*—
Bott, David C.; Edwards, John H.; and Feast, William J., 4,578,443, Cl. 526-285.000.
Callaghan, Ian C.; and Gould, Clive M., 4,577,491, Cl. 73-60.100.
British Picker Company, Ltd., The: *See*—
Howorth, David, 4,577,448, Cl. 52-584.000.
Britt, Crawford R.: *See*—
Weaver, Gregory A.; Price, Lester F.; Britt, Crawford R.; and Shalaby, W. Shalaby, 4,578,451, Cl. 528-292.000.
Broadus, Ronnie J.; and Slade, Randall. Apparatus and method for inspecting welds. 4,577,488, Cl. 73-40.000.
Brochman, Wilfred R., to Minnesota Mining and Manufacturing Company. Tape closure for a can end. 4,577,777, Cl. 220-359.000.
Brode, George L.; and Chow, Sui-Wu, to Union Carbide Corporation. High-ortho phenol-formaldehyde resoles containing hemiformal groups. 4,578,448, Cl. 528-139.000.
Brook, Richard M., to Autosystems Limited. Weighing apparatus. 4,577,708, Cl. 177-145.000.
Brother Industries, Ltd.: *See*—
Sasaki, Ryoichi, 4,577,982, Cl. 400-17.000.
Brother Kogyo Kabushiki Kaisha: *See*—
Yamamoto, Takemi; Kuzuya, Susumu; Kagami, Isao; and Takenaka, Yuuichi, 4,577,984, Cl. 400-625.000.
Brouse, S. Bernard, to United States Steel Corporation. Knotting apparatus for wire strapping machine. 4,577,554, Cl. 100-26.000.
Brown, Alfred: *See*—
Gassmann, Zean Z.; Hawkins, Jeffrey T.; and Brown, Alfred, 4,577,688, Cl. 166-245.000.
Brown, Barry D., to Datak Corporation, The. Adhesive products. 4,578,136, Cl. 156-249.000.
Brown, Donald R., to AT&T Technologies, Inc. Surface mounted electrical components and method of fabrication. 4,578,736, Cl. 361-306.000.
Brown, Eugene C., to Data Vu Company. CRT magnifying lens attachment and glare reduction system. 4,577,928, Cl. 350-276.00R.
Brown, Ivonne: *See*—
Tietjen, Marlene; Brown, Ivonne; and Macchio, Ralph A., 4,578,266, Cl. 424-63.000.
Browne, John, to Nei Canada Limited. Display. 4,577,427, Cl. 40-449.000.
Browning, James E., to International Telephone and Telegraph Corporation. Wheel cover center retention system. 4,577,909, Cl. 301-37.0TP.
Bruckner, Harald, to Krupp Industrietechnik Werk Buckau-Wolf; Starcosa GmbH; and Versuchs- und Lehranstalt fur Spiritusfabrikation und Fermentationstechnologie in Berlin. Process for extracting polar organic compounds, in particular lower aliphatic alcohols, from their aqueous solutions, and fluids particularly suitable for this purpose. 4,578,525, Cl. 568-918.000.
Brunet, Michel, to Etablissements Valois. Valve for dispensing a measured volume of fluid from a container containing a fluid substance under pressure. 4,577,784, Cl. 222-402.200.
Brunswick Corporation: *See*—
Chmielewski, Cary J., 4,577,599, Cl. 123-179.00B.
Buchel, Karl H.: *See*—
Jager, Gerhard; Bockmann, Klaus; Buchel, Karl H.; Brandes, Wilhelm; Frohberger, Paul-Ernst; and Scheinpflug, Hans, 4,578,396, Cl. 514-383.000.
Buchler, Rene . Device for mounting an object. 4,577,846, Cl. 269-82.000.
Budd, William; and Sandstrom, Paul H., to Goodyear Tire & Rubber Company, The. Process for making powdered rubber. 4,578,411, Cl. 524-156.000.
Buehler, Ernest: *See*—
Chai, Bruce H.; Buehler, Ernest; Flynn, John J.; and Morris, Robert C., 4,578,146, Cl. 156-623.00R.
Buehler Products, Inc.: *See*—
Welterlin, Raymond E., 4,578,606, Cl. 310-68.00R.
Buell, Kenneth B., to Procter & Gamble Company, The. Disposable absorbent article having an improved liquid migration resistant perimeter construction. 4,578,071, Cl. 604-379.000.
Buhl, Reihard; and Westphal, Paul, to Lemforder Metallwaren AG. Ball and socket joint. 4,577,987, Cl. 403-133.000.
Buisson, Marc F. B.: *See*—
Bayle-Laboure, Gerard J. P.; Bouiller, Jean G.; Buisson, Marc F. B.; and Soligny, Marcel R., 4,577,814, Cl. 244-12.500.
Bunge, Richard H.: *See*—
Stampwala, Suresh S.; French, James C.; Tunac, Josefino B.; Hurley, Timothy R.; and Bunge, Richard H., 4,578,383, Cl. 514-7.000.
Buonomo, Franco; Bellussi, Giuseppe; and Notari, Bruno, to Enichimica S.p.A. Process for preparing quaternary ammonium hydroxides by electrolysis. 4,578,161, Cl. 204-102.000.
Buote, William J.: *See*—
Hutchins, Burleigh M.; Buote, William J.; and Finn, Lawrence J., 4,578,764, Cl. 364-513.000.
Bur, Anthony J.; and Roth, Steven C., to United States of America, Air Force. Dynamic polymer pressure transducer with temperature compensation. 4,577,510, Cl. 73-708.000.
Burcham, George R. Blending rubber for retreading. 4,577,971, Cl. 366-76.000.
Burckett St. Laurent, James C. T. R.; and Busch, Alfred, to Procter & Gamble Company, The. Fabric softeners. 4,578,200, Cl. 252-8.800.
Burgdorf, Jochen; Birkenbach, Alfred; and Klimt, Ulrich, to ITT Industries, Inc. Floating caliper spot type disc brake. 4,577,731, Cl. 188-73.330.
Burger, Rainer, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Rotary web printing machine. 4,577,559, Cl. 101-221.000.
Burns, Lyle D.; and Stahl, G. Allan, to Phillips Petroleum Company. N-vinyl lactam/unsaturated amide copolymers in thickened acid compositions. 4,578,201, Cl. 252-8.55C.
Burroughs Corporation: *See*—
Braude, Ruvim, 4,578,619, Cl. 313-586.000.
Burrous, Homer R.: *See*—
Armstrong, Thomas E.; Boob, Douglas L.; Burrous, Homer R.; Fryc, Oldrich; and Wagner, David L., 4,577,794, Cl. 227-119.000.
Burt, Roy J.: *See*—
Sliwa, John W.; Burt, Roy J.; Lee, Chune; MacKay, John; and Johnson, Cindy A., 4,577,398, Cl. 29-590.000.
Busch, Alfred: *See*—
Burckett St. Laurent, James C. T. R.; and Busch, Alfred, 4,578,200, Cl. 252-8.800.
Bush, E. Dan, to Handy Button Machine Company. Button collet. 4,577,373, Cl. 24-90.00B.
Butler, Claude O. Tandem wheel flexible drive suspension. 4,577,711, Cl. 180-24.100.
Butler, John D., to Mechtrix Corporation. Compound-angle blade for stripping insulated electrical conductors. 4,577,405, Cl. 30-90.100.
Byer, Robert L.: *See*—
Kane, Thomas J.; and Byer, Robert L., 4,578,793, Cl. 372-94.000.
Byk Guiden Lomberg Chemische Fabrik GmbH: *See*—
Keller, Heimo; Keppler, Bernhard; Kruger, Uwe; and Linder, Rudolf, 4,578,401, Cl. 514-49.000.
C F Braun & Co.: *See*—
Jungerhans, Robert R. J., 4,578,214, Cl. 252-376.000.
C-I-L Inc.: *See*—
Cameron, Gordon M., 4,578,262, Cl. 423-522.000.
C. Van Der Lely N.V.: *See*—
van der Lely, Ary; and Bom, Cornelis J. G., 4,577,456, Cl. 56-13.600.
Caddy, Michael J., to United States of America, Navy. Computer-aided process for generating camera-ready graphical artwork. 4,578,766, Cl. 364-521.000.
Cadek, Walter, to Vereinigte Edestahlwerke Aktiengesellschaft (VEW). Metallurgical vessel. 4,578,794, Cl. 373-42.000.
Cadwell, Dennis J., to Westinghouse Electric Corp. Nuclear reactor fuel assembly spacer grid. 4,578,240, Cl. 376-441.000.
Calkins, Edward H. Reduced moisture smokers pipe. 4,577,645, Cl. 131-196.000.
Calkins, George B.: *See*—
Sarnoff, Stanley J.; Calkins, George B.; and Tarello, William R., 4,578,054, Cl. 604-191.000.
Callaghan, Ian C.; and Gould, Clive M., to British Petroleum Company, p.l.c., The. Method for determining the stability of foam. 4,577,491, Cl. 73-60.100.
Callaway, Ernest F. Ridge row clamp. 4,577,442, Cl. 52-57.000.
Calvert, Rodney K.; and Fishback, Alton J., to Mead Corporation, The. Apparatus for arranging articles in groups. 4,577,745, Cl. 198-420.000.
Calvert, Wynne: *See*—
Sanders, Thomas C.; and Calvert, Wynne, 4,578,663, Cl. 335-306.000.
Cambridge Instruments Limited: *See*—
Barker, John C., 4,578,765, Cl. 364-514.000.
Camco, Incorporated: *See*—
Eatwell, William D., 4,577,685, Cl. 166-115.000.
Pringle, Ronald E., 4,577,654, Cl. 137-219.000.
Cameron, Gordon M., to C-I-L Inc. Liquid sulphur dioxide manufacture. 4,578,262, Cl. 423-522.000.
Camp Dresser & McKee, Inc.: *See*—
Meckler, Gershon, 4,577,471, Cl. 62-271.000.
Campbell, Wallace S., III, to American Television & Communications Corporation. CATV tap-off unit with detachable directional coupler. 4,578,702, Cl. 358-86.000.
Campos-Loriz, Diego, to Kennecott Corporation. Silicon carbide refractories having modified silicon nitride bond. 4,578,363, Cl. 501-89.000.
Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence of Her Majesty's Canadian Government: *See*—
Preston, Jonathan M., 4,578,586, Cl. 250-382.000.
Canada, The Government of: *See*—
Fong, Wing C.; Fournier, Albert J.; and Gil, Bernard B., 4,577,518, Cl. 73-864.910.
Cann, Gordon L. Spacecraft optimized arc rocket. 4,577,461, Cl. 60-203.100.
Cannon, John J., to Pfizer Inc. Immobilization of catalytically active microorganisms in agar gel fibers. 4,578,354, Cl. 435-178.000.

Canon Kabushiki Kaisha: *See*—
Aoyagi, Masao; Kobayashi, Kazufumi; and Yasuda, Keiichi, 4,577,934, Cl. 350-430.000.
Okuno, Takuo, 4,578,688, Cl. 346-157.000.
Sawamura, Mitsuharu; Ito, Susumu; Matsushima, Masaaki; Kishi, Hiroyoshi; Sasamori, Eizo; Yoshihara, Satoshi; Iijima, Shigeharu; and Takano, Katsuhiko, 4,578,322, Cl. 428-694.000.
Sugiura, Susumu; and Sugino, Takashi, 4,578,714, Cl. 358-283.000.
Cantatore, Giuseppe, to Ciba-Geigy S.p.A. Polyaminoamides containing polyalkylpiperidine radicals. 4,578,454, Cl. 528-327.000.
Canterino, Peter J.: *See*—
Shaw, Richard G.; and Canterino, Peter J., 4,578,431, Cl. 525-387.000.
Cardwell, John G., Jr., to General Electric Company. Tungsten halogen incandescent lamp having an improved mounting structure. 4,578,616, Cl. 313-579.000.
Cariolaro, Gianfranco: *See*—
Molo, Francesco; Cucchi, Silvio; and Cariolaro, Gianfranco, 4,578,790, Cl. 370-50.000.
Carl McCrory Enterprises, Inc.: *See*—
McCrory, Carl E.; and Hall, Herbert G., 4,577,975, Cl. 366-314.000.
Carl, William P.: *See*—
Ezzell, Bobby R.; Carl, William P.; and Mod, William A., 4,578,512, Cl. 562-586.000.
Carl-Zeiss-Stiftung: *See*—
Grosser, Siegfried; Ludwig, Christian; Wallner, Kurt; Herzog, Karl; and Bayerl, Eugen, 4,577,944, Cl. 352-25.000.
Carle & Montanari S.p.A.: *See*—
Salicini, Sandro, 4,577,451, Cl. 53-58.000.
Carlson, Richard K., to MPC Products Corporation. Coaxial coupling and locking mechanism. 4,577,990, Cl. 403-342.000.
Carlson, Robert A.; and Smith, Nicholas H., to Reptech, Inc. Refractory insulator blanket and cover. 4,577,839, Cl. 266-272.000.
Carmillet, Roger F. L., to VALEO. Clutch cover assembly. 4,577,740, Cl. 192-70.180.
Carosella, David P. E., Jr.: *See*—
Yampolsky, Jack S.; and Carosella, David P. E., Jr., 4,577,682, Cl. 165-160.000.
Carrier Corporation: *See*—
Drucker, Alan S.; and Kwok, King H., 4,577,828, Cl. 248-678.000.
Pandeya, Prakash N.; and Chu, Tsuwei, 4,577,472, Cl. 62-324.600.
Carroll, James M. Apparatus for insulating water faucets. 4,577,655, Cl. 137-375.000.
Carson, Charles F. Apparatus for finishing waistband end portions. 4,577,571, Cl. 112-121.150.
Carter, Guy T.; Borders, Donald B.; Goodman, Joseph J.; and Labeda, David P., to American Cyanamid Company. Antibiotic LL-D42067β. 4,578,468, Cl. 546-35.000.
Carter, Nicholas J. R.: *See*—
Middleton, Francisco A.; Carter, Nicholas J. R.; and Das, Santanu, 4,578,789, Cl. 370-58.000.
Casio Computer Co., Ltd.: *See*—
Inagaki, Naoki, 4,578,811, Cl. 382-11.000.
Tsuzuki, Hanzou, 4,578,568, Cl. 235-436.000.
Yamana, Kozi, 4,577,540, Cl. 84-1.270.
Castex Products Limited: *See*—
Whitehead, Derek J., 4,578,263, Cl. 424-15.000.
Castille, Alan J., to Hub City Iron Works, Inc. Pipe joint having pressure activated sealing means. 4,577,895, Cl. 285-334.000.
Caterpillar Tractor Co.: *See*—
Richards, David L.; and Windish, Willis E., 4,577,524, Cl. 74-411.500.
Catone, David L.: *See*—
Huege, Fred R.; Slepetys, Richard A.; and Catone, David L., 4,578,118, Cl. 106-288.00B.
Cavalli, Walter, to O.M.C. s.n.c. di Walter & Dante Cavalli. Automatic device for advancement of revolving mechanical organs. 4,577,532, Cl. 74-841.000.
Celanese Corporation: *See*—
Doerr, Marvin L., 4,578,510, Cl. 562-483.000.
Kalnin, Ilmar L.; Goldberg, Harris A.; and Williams, Clyde C., 4,577,979, Cl. 374-178.000.
Celli, Aldo. Prefabricated structural connector for steel-frame buildings. 4,577,449, Cl. 52-721.000.
Centre National de la Recherche Scientifique: *See*—
Jaffrin, Michel; and Reach, Gerard, 4,578,191, Cl. 210-323.200.
Cetec Corporation: *See*—
Bingaman, Barrett P.; Krum, Richard G.; and Williams, James R., 4,577,790, Cl. 226-118.000.
Cetinkaya, Ismail B.; and Myers, Daniel N., to UOP Inc. FCC combustion zone catalyst cooling process. 4,578,366, Cl. 502-6.000.
Chai, Bruce H.; Buehler, Ernest; Flynn, John J.; and Morris, Robert C., to Allied Corporation. Process for growing a large single crystal from multiple seed crystals. 4,578,146, Cl. 156-623.00R.
Chan, Yuen H.; and Struk, James R., to International Business Machines Corporation. Voltage mode operation scheme for bipolar arrays. 4,578,779, Cl. 365-190.000.
Chang, Clarence D.; and Hellring, Stuart D., to Mobil Oil Corporation. Shape-selective catalytic oxidation of phenol. 4,578,521, Cl. 568-771.000.
Chang, Michael N.: *See*—
Jensen, Norman P.; and Chang, Michael N., 4,578,390, Cl. 514-255.000.
Chang, Mike S. H., to Pitney Bowes Inc. Vinyl-hydro polysiloxane copolymers release compositions. 4,578,493, Cl. 556-451.000.
Chang, Paul: *See*—
Hsia, Steve; and Chang, Paul, 4,577,391, Cl. 29-571.000.
Chaparral Communications, Inc.: *See*—
Howard, H. Taylor, 4,578,681, Cl. 343-786.000.
Chaplin, Russell, to International Business Machines Corporation. Optical vibration analyzer. 4,577,508, Cl. 73-655.000.
Charalambous, Salomi T.; Horvath, Mark P.; House, Cathy P.; Iapicco, Jeffrey A.; Lue, Paul D.; and Verma, Shiv P., to Bell Telephone Laboratories, Incorporated; and AT&T Information Systems Inc. Programmable multiple type data set. 4,578,796, Cl. 375-8.000.
Chasen, Lee R., to Coats & Clark, Inc. Self adjusting tongs. 4,577,900, Cl. 294-118.000.
Chassaing, Jacques, to ADIDAS Fabrique de Chaussures de Sport. High-top shoe. 4,577,419, Cl. 36-89.000.
Chemische Werke Huls Aktiengesellschaft: *See*—
Hofmann, Peter, 4,578,367, Cl. 502-24.000.
Chen, Bor-Uei, to TRW Inc. High-power injection laser diode structure. 4,578,791, Cl. 372-50.000.
Chen, Tsang J.: *See*—
Staudenmayer, William J.; Chen, Tsang J.; Borsenberger, Paul M.; and Grashof, Hans R., 4,578,333, Cl. 430-60.000.
Cheng, Chen-Yen; and Cheng, Sing-Wang. Wet and dry distillative freezing process for separating mixtures and apparatuses for use therein. 4,578,093, Cl. 62-12.000.
Cheng, Sing-Wang: *See*—
Cheng, Chen-Yen; and Cheng, Sing-Wang, 4,578,093, Cl. 62-12.000.
Chernega, John O. Adjustable flex ski. 4,577,886, Cl. 280-602.000.
Chiarella, Michele A. Bicycle chain cleaning device and method. 4,578,120, Cl. 134-9.000.
Chiba, Masae: *See*—
Taneda, Kozo; Chiba, Masae; Naka, Junichi; and Watanabe, Shunichi, 4,578,002, Cl. 406-28.000.
Chien, Sze-Foo: *See*—
Huang, Wann-Sheng; and Chien, Sze-Foo, 4,577,691, Cl. 166-263.000.
Chimes, Philip R.: *See*—
Jones, Donald H.; Allen, Spencer W.; and Chimes, Philip R., 4,578,763, Cl. 364-513.000.
Chimica del Friuli S.p.A.: *See*—
Rossi, Pietro P.; Senni, Paolo; and Ferruzzi, Sergio, 4,578,511, Cl. 562-494.000.
Chisso Corporation: *See*—
Ando, Masao, 4,578,564, Cl. 219-301.000.
Chizmar, David A.: *See*—
Junker, Warren R.; Taszarek, Bruce J.; and Chizmar, David A., 4,578,643, Cl. 324-202.000.
Chmielewski, Cary J., to Brunswick Corporation. Remote starter for internal combustion engine. 4,577,599, Cl. 123-179.00B.
Cho, Gyu-Hyeong: *See*—
Gyugyi, Laszlo; Heinrich, Theodore M.; and Cho, Gyu-Hyeong, 4,578,746, Cl. 363-161.000.
Chou, Tai-Sheng; and Lee, Chang-Kuei, to Mobil Oil Corporation. Feed mixing technique for fluidized catalytic cracking of hydrocarbon oil. 4,578,183, Cl. 208-113.000.
Chow, Sui-Wu: *See*—
Brode, George L.; and Chow, Sui-Wu, 4,578,448, Cl. 528-139.000.
Christe, Karl O.: *See*—
Schack, Carl J.; and Christe, Karl O., 4,578,225, Cl. 260-550.000.
Chrysler Corporation: *See*—
Rayne, Joseph, 4,577,534, Cl. 81-484.000.
Chu, Tsuwei: *See*—
Pandeya, Prakash N.; and Chu, Tsuwei, 4,577,472, Cl. 62-324.600.
Chugai Seiyaku Kabushiki Kaisha: *See*—
Nagano, Hiroyuki; Takagi, Mitiro; Kubodera, Noboru; Matsunaga, Isao; Nabata, Hiroyuki; Ohba, Yasuhiro; Sakai, Kazushige; Hata, Shun-ichi; and Uchida, Yasumi, 4,578,465, Cl. 544-285.000.
Ciammaichella, Richard C.; and Youmans, Barry J., to Babcock & Wilcox Company, The. Solid state ultraviolet flame detector. 4,578,583, Cl. 250-339.000.
Ciba-Geigy AG: *See*—
Postle, Stephen R.; and Kingston, Samuel B., 4,578,305, Cl. 428-212.000.
Seiler, Herbert, 4,578,457, Cl. 534-632.000
Ciba-Geigy Corporation: *See*—
Demmer, Christopher G.; and Hathaway, Roderick D., 4,578,438, Cl. 525-481.000.
Wehner, Wolfgang; and Grade, Reinhardt, 4,578,489, Cl. 556-100.000.
Ciba-Geigy S.p.A.: *See*—
Cantatore, Giuseppe, 4,578,454, Cl. 528-327.000.
Cirillo, Fernando A.: *See*—
Sahasrabudhe, Arum P.; Dadpey, Habib; Cirillo, Fernando A.; Merlo, Antonia C.; and Zuber, Pierre A. M., 4,578,754, Cl. 364-426.000.
Citizen Watch Co., Ltd.: *See*—
Fujita, Hiroo, 4,577,967, Cl. 356-349.000.
Kimura, Sosaku; and Hatsuse, Toshikazu, 4,577,845, Cl. 269-73.000.
Claessen, Johannes A. H.: *See*—
Van Uden, Adrianus A.; and Claessen, Johannes A. H., 4,578,132, Cl. 156-72.000.
Clarion Co., Ltd.: *See*—
Kanai, Tsutomu, 4,578,703, Cl. 358-117.000.
Clarisse, Eddy J., to U.S. Philips Corporation. Apparatus adapted to be mounted in a mounting wall. 4,577,818, Cl. 248-27.300.

Clark, Emmett T. Device to automatically lower a lifted toilet seat. 4,577,350, Cl. 4-251.000.
Clark, Harold R.; and Nicol, David A., to AT&T Technologies, Inc. Method for stretching a glass rod. 4,578,101, Cl. 65-109.000.
Clark, Kenneth R.: *See*—
Rayner, Adrien P.; and Clark, Kenneth R., 4,577,776, Cl. 220-307.000.
Clauson, Melvil B.; and Wagner, John R., Jr., to Mobil Oil Corporation. Multi-layer oriented polypropylene films with low COF skin(s). 4,578,316, Cl. 428-516.000.
Claydon, Martin, to U.S. Philips Corporation. System for processing audio frequency information for frequency modulation. 4,578,818, Cl. 455-110.000.
Cleary, Michael T., to UOP Inc. Process for separating saturated fatty acids from each other. 4,578,223, Cl. 260-419.000.
CLECIM: *See*—
Morel, Michel; and Pillac, Bernard, 4,577,484, Cl. 72-245.000.
Clegg, John E. Sink outlet valve. 4,577,349, Cl. 4-203.000.
Clegg, John E. Hemispheric solar panel. 4,577,620, Cl. 126-440.000.
Clegg, John E. Conical beam concentrator. 4,577,936, Cl. 350-432.000.
Clegg, John E. Conical beam concentrator. 4,577,937, Cl. 350-432.000.
Clegg, John E. Conical beam concentrator. 4,577,938, Cl. 350-432.000.
Clegg, John E. Monochromatic beam concentrator. 4,577,939, Cl. 350-443.000.
Clegg, John E. Laser means and method. 4,578,558, Cl. 219-121.0LG.
Clem, Jack L.; and Scott, Oscar T., IV, to J. M. Huber Corporation. Air recuperator cleaner. 4,577,680, Cl. 165-95.000.
Clementini, Luciano; and Spagnoli, Leonardo, to Montedison S.p.A. Modified olefine polymers and process for their manufacture. 4,578,428, Cl. 525-265.000.
Clendinen, Charles D. Snap fastener. 4,577,376, Cl. 24-624.000.
Clouth Summiwerke Aktiengesellschaft: *See*—
Ortwein, Hermann, 4,577,801, Cl. 238-283.000.
Cloutier, Frank L.; McClelland, Paul H.; Boucher, William R.; and Siewell, Gary L., to Hewlett Packard Company. Ink jet printhead having hydraulically separated orifices. 4,578,687, Cl. 346-140.00R.
Coats & Clark, Inc.: *See*—
Chasen, Lee R., 4,577,900, Cl. 294-118.000.
Cochran, Harvey B.: *See*—
Moore, Sanders H.; Smith, Maurice R.; and Cochran, Harvey B., 4,578,195, Cl. 210-679.000.
Coden, Michael H.: *See*—
Scholl, Frederick W.; and Coden, Michael H., 4,578,799, Cl. 375-87.000.
Codenoll Technology Corporation: *See*—
Scholl, Frederick W.; and Coden, Michael H., 4,578,799, Cl. 375-87.000.
Cohen, Joel S.: *See*—
Druffel, James B.; and Cohen, Joel S., 4,577,824, Cl. 248-544.000.
Coin Acceptors, Inc.: *See*—
Holland, Charlie R.; and DelPercio, Michael J., 4,577,780, Cl. 221-125.000.
Coldren, Daniel R.; and Pritulsky, James, to AMP Incorporated. Electrical assembly with cable guiding member. 4,577,920, Cl. 339-143.00R.
Cole, George S., to Energaire Corporation. Sole-and-heel structure having premolded bulges. 4,577,417, Cl. 36-29.000.
Colet, Ralph. Automobile tray trailer. 4,578,014, Cl. 414-483.000.
Colin de Verdiere, Jean-Marc M.; and Langlois, Patrice R., to Societe Anonyme de Telecommunications. Initialization device for echo cancelling device and application thereof to remote echos. 4,578,544, Cl. 179-170.200.
Colla, Joseph. Mechanical propulsion system. 4,577,520, Cl. 74-84.00R.
Collins, Paul W.; and Weier, Richard M., to G. D. Searle & Co. Allenic prostanoic acid derivatives. 4,578,505, Cl. 560-118.000.
Colmon, Daniel; and Letemps, Bernard, to Saint-Gobain Recherche. Quenching or tempering by means of a two-phase jet. 4,578,102, Cl. 65-114.000.
Combs, William J.: *See*—
Berkovits, Barouh V.; Waxman, Menashe B.; and Combs, William J., 4,577,633, Cl. 128-419.0PG.
Combustion Engineering, Inc.: *See*—
Mordarski, Walter J.; and Markiewicz, Jan, 4,578,237, Cl. 376-154.000.
Teigen, Bard C., 4,577,593, Cl. 122-235.00D.
Commissariat a l'Energie Atomique: *See*—
Artaud, Robert; Aubert, Michel; and Renaux, Charley, 4,578,238, Cl. 376-404.000.
Commonwealth Scientific and Industrial Research Organization: *See*—
Garnsworthy, Russell K., 4,577,458, Cl. 57-22.000.
Compagnie Generale de Materiel Orthopedique: *See*—
Pecheux, Jean C., 4,577,623, Cl. 128-25.00R.
Compagnie Generale d'Electricite: *See*—
Mautref, Michel; and Belouet, Christian, 4,577,588, Cl. 118-665.000.
Compagnie Generale des Etablissements Michelin: *See*—
Tournier, Jean-Louis, 4,578,421, Cl. 524-511.000.
Compagnie Industrielle des Telecommunications Cit-Alcatel: *See*—
Le Bourlot, Jean; and Levy, Michel, 4,578,543, Cl. 179-170.200.
Compagnie Parisienne d'Outillage a Air Comprime: *See*—
Bonino, Pierre; Ducret, Christian; and Mazzoleni, Cyrille, 4,577,893, Cl. 285-158.000.
Completion Tool Company: *See*—
Dotson, Charles E., 4,577,689, Cl. 166-250.000.
Suman, George O., 4,577,696, Cl. 166-387.000.
Wood, Edward T., 4,577,695, Cl. 166-387.000.
Compton, David J.: *See*—
Frank, Charles A.; and Compton, David J., 4,577,549, Cl. 92-169.000.
Computer Memories, Inc.: *See*—
Nazarian, Ara W.; and Stupeck, Donald G., 4,578,625, Cl. 318-318.000.
Connon, Thomas R., to United States of America, Air Force. Direct view helmet mounted telescope. 4,577,347, Cl. 2-6.000.
Conoco Inc.: *See*—
Gorin, Everett, 4,578,175, Cl. 208-8.00R.
Container Corporation of America: *See*—
Everman, Wayne F., 4,578,051, Cl. 493-8.000.
Continental Conveyor & Equipment Co., Inc.: *See*—
Pentith, Gerald R. O., 4,577,749, Cl. 198-805.000.
Continental Gummi-Werke Aktiengesellschaft: *See*—
Seitz, Hans; Pieper, Henner; Frerichs, Udo; and Rach, Heinz-Dieter, 4,577,668, Cl. 152-520.000.
Cook, Stuart A.: *See*—
Mayer, John F.; Langdon, Nick H.; Cook, Stuart A.; Nicholson, L. Todd; and Belcher, John R., 4,578,045, Cl. 446-330.000.
Coombs, Daniel M.: *See*—
Kukes, Simon G.; Hogan, Robert J.; Coombs, Daniel M.; and Strope, Daniel J., 4,578,180, Cl. 208-110.000.
CooperVision, Inc.: *See*—
Martinez, Miguel, 4,577,629, Cl. 128-305.000.
Corboy, John F., Jr.; Jastrzebski, Lubomir L.; Blackstone, Scott C.; and Pagliaro, Robert H., Jr., to RCA Corporation. Method for growing monocrystalline silicon through mask layer. 4,578,142, Cl. 156-612.000.
Corby, Nelson R., Jr.; and Godwin, Stanley J., to General Electric Company. Method of enhancing weld pool boundary definition. 4,578,561, Cl. 219-124.340.
Cordis Corporation: *See*—
Beranek, William J., 4,577,643, Cl. 128-785.000.
Sussman, Marvin L., 4,578,057, Cl. 604-9.000.
Corley, Daniel M.: *See*—
Gillespie, John R.; and Corley, Daniel M., 4,578,111, Cl. 75-65.00R.
Cormier, Milton J., to University of Georgia Research Foundation, Inc. Use of phenothiazine 5-oxide drugs as vaginal contraceptives. 4,578,379, Cl. 514-223.000.
Cormier, Milton J., to University of Georgia Research Foundation, Inc. Use of phenothiazine 5-oxide drugs in uterus to prevent pregnancy. 4,578,385, Cl. 514-223.000.
Cornelius Company, The: *See*—
Fessler, Herman S., 4,577,782, Cl. 222-129.100.
Cornils, Boy: *See*—
Bahrmann, Helmut; Cornils, Boy; Konkol, Werner; and Lipps, Wolfgang, 4,578,523, Cl. 568-454.000.
Corning Glass Works: *See*—
Berkey, George E., 4,578,097, Cl. 65-3.110.
Hertl, William; and Schaeffler, Robert G., 4,578,323, Cl. 429-15.000.
Cosgrove, John: *See*—
Oliver, Stewart W.; and Cosgrove, John, 4,578,536, Cl. 179-2.0AM.
Cosgrove, Robert J., Jr.; and Smolen, Victor F., to Pharmacontrol Corp. Sampling apparatus for obtaining a plurality of fluid samples. 4,578,244, Cl. 422-65.000.
Cotter, Christopher G.: *See*—
Simon, Mark I.; Cotter, Christopher G.; and Stein-Gelinas, Carolyn, 4,577,639, Cl. 128-709.000.
Couch, Robert P.: *See*—
Rosenbush, David M.; Zwicke, Philip E.; and Couch, Robert P., 4,578,756, Cl. 364-431.020.
Coulter, Leland E., to Teledyne, Inc. Laser welding apparatus. 4,578,554, Cl. 219-121.0LC.
Cousino, Kenneth P. Sewerage flow diverter. 4,578,188, Cl. 210-170.000.
Coutant, John E.: *See*—
Cregge, Robert J.; and Coutant, John E., 4,578,464, Cl. 544-236.000.
Cox, James D., Jr. Torsional thrust tool. 4,577,522, Cl. 74-127.000.
CPC International Inc.: *See*—
Katkocin, Dennis M.; Word, Nancy S.; and Yang, Shiow-Shong, 4,578,352, Cl. 435-99.000.
CPG Products Corp.: *See*—
Mayer, John F.; Langdon, Nick H.; Cook, Stuart A.; Nicholson, L. Todd; and Belcher, John R., 4,578,045, Cl. 446-330.000.
Crawford, Carl R.; Shimoni, Yair; Sohval, A. Robert; and Barnea, Daniel I., to Elscint Ltd. Systems and methods for minimizing noncoplanarity artifacts. 4,578,753, Cl. 364-414.000.
Cregge, Robert J.; and Coutant, John E., to Merrell Dow Pharmaceuticals Inc. 6-Hydroxyalkylamino-8-methyl-1,2,4-triazolo-[4,3-b]pyridazine and related compounds. 4,578,464, Cl. 544-236.000.
Crenshaw, Ronnie R.; and Algieri, Aldo A., to Bristol-Myers Company. Substituted amino alkyl pyridyl ethanediimidamides. 4,578,471, Cl. 546-193.000.
Creo Electronics Corporation: *See*—
Gelbart, Daniel, 4,577,932, Cl. 350-358.000.
Crepinsek, Alois. Strike plate and security chain latch. 4,577,896, Cl. 292-264.000.
Crevling, Robert L., Jr.: *See*—
Miller, Jonathan; Berfield, Robert C.; and Crevling, Robert L., Jr., 4,577,366, Cl. 15-388.000.
Crisp, Richard D.: *See*—
McAlister, Doyle V.; and Crisp, Richard D., 4,578,601, Cl. 307-475.000.

Crook, Michael J.: *See*—
Poole, Michael J.; and Crook, Michael J., 4,577,506, Cl. 73-633.000.
Crooke, Arthur W.; Gyles, Colin; and Stebbins, Edwin E., to Analogic Corporation. Oscilloscope control. 4,578,640, Cl. 324-115.000.
Crosby, Terry R. Wine rack. 4,577,765, Cl. 211-75.000.
Cross, Donald G., to Smith International, Inc. Bellows lubricant pressurizer for sealed bearing rock bits. 4,577,705, Cl. 175-228.000.
Crossley, Roger, to John Wyeth & Brother Limited. Process for preparing 1-(3-bromo-2-alkylpropanoyl)-L-proline derivatives. 4,578,480, Cl. 548-533.000.
Crotty, David E., to OMI International Corporation. Non-peroxide trivalent chromium passivate composition and process. 4,578,122, Cl. 148-6.200.
Cruchon, Jean-Claude; and Schubert, Jean-Denis, to Alcatel Thomson Faisceaux Hertziens. Filter of the type consisting of a primary waveguide having lateral secondary guides. 4,578,657, Cl. 333-211.000.
Cruchon, Jean-Claude: *See*—
Etienne, Jean-Luc; and Cruchon, Jean-Claude, 4,578,655, Cl. 333-202.000.
Crum, Michael A., to Leggett & Platt, Incorporated. Rocker recliner and away-from-the-wall recliner chairs. 4,577,902, Cl. 297-85.000.
Cruz, Mamerto M., Jr., to Alcon (Puerto Rico) Inc. Hemostatic-adhesive, collagen dressing for severed biological surfaces. 4,578,067, Cl. 604-368.000.
Csizer, Zoltan; Sikos, Karoly; Bacskai, Laszlo; Joo, Istvan; Niedermayer, Eleonora; Rethy, Lajos; and Zsidai, Jozsef, to Human Oltoanyagtermelo Es Kutato Intezet. Process for the preparation of lyophilized, adsorbed polyvalent vaccines. 4,578,270, Cl. 424-92.000.
Cucchi, Silvio: *See*—
Molo, Francesco; Cucchi, Silvio; and Cariolaro, Gianfranco, 4,578,790, Cl. 370-50.000.
Cudmore, Warner J. G. Polyethylene terephthalate saponification process. 4,578,502, Cl. 560-79.000.
Cunningham, Jock B., to Mount Isa Mines Limited. Conveyor belt monitor. 4,577,502, Cl. 73-600.000.
Cunningham, Larry L. By-products chiller and method for using same. 4,577,466, Cl. 62-63.000.
Currie, Brian; Gardiner, Thomas; and Green, Henry M., to Lambeg Industrial Research Association; and Ulster Polytechnic. Fabric reinforced cement structure. 4,578,301, Cl. 428-109.000.
Cyclomatic Industries, Inc.: *See*—
Silke, Gerald W.; and Weber, Frank D., 4,577,499, Cl. 73-432.00R.
Cyphelly, Ivan J., to Glyco-antriebstechnik GmbH. Hydrostatic clutch. 4,577,739, Cl. 192-61.000.
Cyriacy, Frieda; Albers, Horst; and Havemann, Ingeborg. Apparatus for making boreholes in the lateral walls of narrow underground mine workings. 4,577,703, Cl. 175-79.000.
Dacol, Frank H.: *See*—
Baumann, Thomas; Dacol, Frank H.; and Melcher, Robert L., 4,578,584, Cl. 250-341.000.
Dadpey, Habib: *See*—
Sahasrabudhe, Arum P.; Dadpey, Habib; Cirillo, Fernando A.; Merlo, Antonia C.; and Zuber, Pierre A. M., 4,578,754, Cl. 364-426.000.
Dahlberg, Larry J.: *See*—
Brackett, John E.; and Dahlberg, Larry J., 4,577,432, Cl. 43-23.000.
Daikin Kogyo Co., Ltd.: *See*—
Hisamoto, Iwao; and Omure, Yukio, 4,578,209, Cl. 252-143.000.
Ishikawa, Nobuo; and Takahashi, Mitsuru, 4,578,222, Cl. 260-413.000.
Ishikawa, Nobuo; Nakai, Takeshi; and Inouye, Yoshio, 4,578,503, Cl. 560-82.000.
Daimler-Benz Aktiengesellschaft: *See*—
Klak, Roland, 4,577,601, Cl. 123-298.000.
Dainippon Screen Mfg. Co., Ltd.: *See*—
Nakaji, Etsuo, 4,578,701, Cl. 358-78.000.
Dalle, Yves H. Device for opening out and folding back one or more thermal screens inside a hothouse. 4,577,436, Cl. 47-17.000.
D'Amico, John J., to Monsanto Company. N-substituted benzothiazoline and N-substituted benzoxaline derivatives. 4,578,477, Cl. 548-165.000.
Dana Corporation: *See*—
Hickey, John L., 4,577,530, Cl. 74-713.000.
Danby Systems Ltd.: *See*—
Dodds, David E., 4,578,541, Cl. 179-18.0FA.
Danguy, Jacques: *See*—
Urien, Jacques; Bressan, Elie; Danguy, Jacques; and Narzul, Marcel, 4,578,658, Cl. 333-227.000.
Daniele, Joseph J.: *See*—
Yip, Kwok-leung; and Daniele, Joseph J., 4,577,933, Cl. 350-358.000.
DAP Inc.: *See*—
Learner, Eugene L., 4,578,415, Cl. 524-322.000.
Darda, Siegfried: *See*—
Stricker, Herbert; Freund, Bernhard; Harwalik, Heribert; Rominger, Karl L.; Darda, Siegfried; Haselbarth, Volkmar; Arndts, Dietrich; Bechtel, Wolf D.; Bozler, Gerhard; Brickl, Rolf; and Gruber, Peter, 4,578,264, Cl. 424-37.000.
Das, Santanu: *See*—
Middleton, Francisco A.; Carter, Nicholas J. R.; and Das, Santanu, 4,578,789, Cl. 370-58.000.
Data Information Management Systems, Inc.: *See*—
Hice, John R., 4,578,572, Cl. 235-472.000.
Data Recording Systems, Inc.: *See*—
Spencer, David R.; and Goldstein, Amnon, 4,578,689, Cl. 346-160.000.
Data Vu Company: *See*—
Brown, Eugene C., 4,577,928, Cl. 350-276.00R.
Datak Corporation, The: *See*—
Brown, Barry D., 4,578,136, Cl. 156-249.000.
Datakey, Inc.: *See*—
Flies, William P.; and Wehrmacher, William H., 4,578,573, Cl. 235-492.000.
Daulton, Richard H.: *See*—
Granzow, Robert H.; Daulton, Richard H.; Placke, Dale L.; Adelberger, Donald L.; Gross, Jack R.; and Nagy, Charles S., 4,578,009, Cl. 414-43.000.
Davidov, Mircho A. Two-way electrical control module for a lamp outlet. 4,578,593, Cl. 307-113.000.
Davis, Mitchell F. Flypaper trap. 4,577,434, Cl. 43-115.000.
Davis, Terrence A.: *See*—
Soderstrom, Edwin D., III; and Davis, Terrence A., 4,578,151, Cl. 203-1.000.
Davison, Sol, to Shell Oil Company. Controlled degradation or cracking of alpha-olefin polymers. 4,578,430, Cl. 525-387.000.
Dawidowitch, Shmuel. Combined electric heating and water inlet/outlet assembly for water heating tanks. 4,578,565, Cl. 219-314.000.
Dawson, Daniel J.; and Otteson, Kenneth M., to Air Products and Chemicals, Inc. Preparing N-vinylformamide. 4,578,515, Cl. 564-215.000.
Deere & Company: *See*—
Smith, Joseph J.; and Erickson, Paul K., 4,577,717, Cl. 180-9.100.
Deets, Gary L.; and Trementozzi, Quirino A., to Monsanto Company. Polyblends of polyphenylene oxide and styrene-acrylonitrile polymers having broad acrylonitrile compositional distribution. 4,578,423, Cl. 525-68.000.
Degenford, James E.; and Boire, Daniel C., to Westinghouse Electric Corp. Monolithic microwave "split load" phase inverter for push-pull monolithic FET amplifier circuits. 4,578,629, Cl. 323-217.000.
Deger, Hans-Matthias; Erckel, Rudiger; and Fruhbeis, Horst, to Hoechst Aktiengesellschaft. Benzo[de]pyrano[3,2-g]isoquinoline derivatives useful as dyestuffs. 4,578,469, Cl. 546-66.000.
de Guillenschmidt, Pierre; Hubert, Jacques; Goujon, Michel; and Saunier, Christian, to Giravions Dorand. Method and equipment for the control of aiming and firing at a real target. 4,577,962, Cl. 356-5.000.
Degussa Aktiengesellschaft: *See*—
Kiss, Akos; Kleinschmit, Peter; Volker, Werner; and Halbritter, Gunter, 4,578,212, Cl. 252-301.40F.
Panster, Peter; and Kleinschmit, Peter, 4,578,496, Cl. 556-479.000.
Dekker, Theodor G.: *See*—
Fourie, Theunis G.; Dekker, Theodor G.; Snyckers, Friedrich O.; and van der Schyf, Cornelis J., 4,578,520, Cl. 568-315.000.
Delaporte, Francois-Xavier; Lebesnerais, Gerard M.; and Pantani, Jean-Pierre, to International Business Machines Corporation. Monolithic autobiased resistor structure and application thereof to interface circuits. 4,578,695, Cl. 357-48.000.
Delay, Francois: *See*—
Morris, Anthony F.; Delay, Francois; Gautschi, Fritz; Thomas, Alan F.; Giersch, Wolfgang K.; and Boschung, Andre, 4,578,277, Cl. 426-538.000.
Delbosse, Andre , to Merlin Gerin. Electronic circuit controlling a multiple operation apparatus fitted with an electromagnetic mechanism. 4,578,734, Cl. 361-152.000.
Delia, Anthony, to Drackett Company, The. Child resistant container. 4,577,769, Cl. 215-211.000.
Dellinger, Thomas B.; Boston, William G.; Sexton, James H.; and Strong, Robert T., to Mobil Oil Corporation. Method and system for displacing drilling fluid from a drill string in a well drilling system. 4,577,700, Cl. 175-40.000.
Dellinger, Thomas B.; and Gravley, Wilton, to Mobil Oil Corporation. System of drilling deviated wellbores. 4,577,701, Cl. 175-61.000.
Delma, electro- und medizinische Appatebau Gesellschaft mbH: *See*—
Roos, Eberhard, 4 578,575, Cl. 250-203.00R.
DelPercio, Michael J.: *See*—
Holland, Charlie R.; and DelPercio, Michael J., 4,577,780, Cl. 221-125.000.
de Luca, Ugo: *See*—
Vicario, Guido F.; Vicario, Cesare; de Luca, Ugo; and Zelioli, Giuseppe, 4,578,169, Cl. 204-299.00R.
Demerson, Christopher A.: *See*—
Mobilio, Dominick; Demerson, Christopher A.; and Humber, Leslie G., 4,578,398, Cl. 514-411.000.
Demetriades, Peter G. Floor cleaning machine. 4,577,364, Cl. 15-320.000.
Demmer, Christopher G.; and Hathaway, Roderick D., to Ciba-Geigy Corporation. Preparation of resinous products. 4,578,438, Cl. 525-481.000.
de Rojas, Edward: *See*—
Frieder, Philip M.; and de Rojas, Edward, 4,577,942, Cl. 351-159.000.
Derouane, Eric G.; and Varghese, Philip, to Mobil Oil Corporation. Hydrothermal conversion of heavy oils and residua with highly dispersed catalysts. 4,578,181, Cl. 208-110.000.
Desai, Anil I.; and Westerfeld, Eric C., to Four-Phase Systems, Inc. Circuit board status detection system. 4,578,773, Cl. 364-900.000.
de Souza, Noel J.: *See*—
Schorlemmer, Hans-Ulrich; Dickneite, Gerhard; Sedlacek, Hans-Harald; de Souza, Noel J.; and Dohadwalla, Alihussein N., 4,578,399, Cl. 514-455.000.

Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH: *See*—
Gembus, Hans-Dieter; and Wolf, Rainer, 4,577,659, Cl. 137-614.060.

Deutschmann, Herbert; and Schier, Karl, to MTU Motoren-und Turbinen-Union Friedrichshafen, GmbH. Piston for a reciprocating piston internal combustion engine. 4,577,595, Cl. 123-41.350.

Dewey, Anthony G.; and Marinelli, Charles P., to International Business Machines Corporation. Fiber optic writing head. 4,577,926, Cl. 350-96.250.

DiBartolo, Ernest A., to Sun Hydraulics Corporation. Calibrated hand-knob assembly. 4,577,831, Cl. 251-93.000.

Dichtjar, Gerhard: *See*—
Assmann, Helmut; Dichtjar, Gerhard; Dorr, Wolfgang; Maier, Georg; Mathieu, Viktor; and Peehs, Martin, 4,578,229, Cl. 264-0.500.

Dickneite, Gerhard: *See*—
Schorlemmer, Hans-Ulrich; Dickneite, Gerhard; Sedlacek, Hans-Harald; de Souza, Noel J.; and Dohadwalla, Alihussein N., 4,578,399, Cl. 514-455.000.

Dickson, Thomas: *See*—
Macangus, Alexander; and Dickson, Thomas, 4,578,037, Cl. 434-258.000.

Didde Graphic Systems Corporation: *See*—
Shackelford, Michael L., 4,577,527, Cl. 74-640.000.

Didier-Werke AG: *See*—
Reinartz, Dieter; Bender, Heinrich; and Laurent, Gunter, 4,578,194, Cl. 210-673.000.

Diekhoff, Hans H., to Aluminum Company of America. Reforming necked-in portions of can bodies. 4,578,007, Cl. 413-6.000.

Diesel Kiki Co., Ltd.: *See*—
Okura, Eiji, 4,577,469, Cl. 62-126.000.
Ueno, Masahito, 4,577,718, Cl. 180-179.000.

Diesner, Willi, to Petig Corporation. Narrow-fabric needle loom weaving system. 4,577,665, Cl. 139-431.000.

Diffely, Robert J., Sr. Trolling attachment for boats. 4,577,580, Cl. 114-285.000.

Di Maio, Anthony E.: *See*—
Racca, Richard F.; Swier, Willem; and Di Maio, Anthony E., 4,577,783, Cl. 222-386.500.

Dimmit, Jeffrey H.; Van Der Puy, Michael; and Soriano, David S., to Allied Corporation. Method for the recovery of palladium. 4,578,250, Cl. 423-22.000.

Dinapoli, Frank C.: *See*—
James, Bertram G.; Dinapoli, Frank C.; and Hayes, Lloyd P., 4,578,620, Cl. 315-3.500.

Dinerstein, Frances; and Dinerstein, Lia. Fingernail shielding device. 4,577,648, Cl. 132-73.000.

Dinerstein, Lia: *See*—
Dinerstein, Frances; and Dinerstein, Lia, 4,577,648, Cl. 132-73.000.

Dion, Eric P., to Mobil Oil Corporation. Method for depth referencing hydrocarbon gas shows on mud logs. 4,578,579, Cl. 250-256.000.

Dion, Exsior. Simplified apparatus for use in arm wrestling or wrist pulling contests. 4,577,857, Cl. 272-67.000.

Director-General of Agency of Industrial Science and Technology: *See*—
Ueno, Masakazu; and Ichimura, Takeshige, 4,578,696, Cl. 357-59.000.

Dirksing, William P.; Leman, Marvin G.; and Van Coney, Robert H., to Procter & Gamble Company, The. Expandable core pin for blow-molding a container having a neck-portion with internal attachment means. 4,578,028, Cl. 425-525.000.

DiStefano, Thomas H.: *See*—
Ahn, Kie Y.; DiStefano, Thomas H.; and Jipson, Victor B., 4,578,788, Cl. 369-275.000.

Divecha, Amarnath P.; Karmarkar, Subhash D.; and Foltz, John V., to United States of America, Navy. Process for producing graphite fiber/aluminum-magnesium matrix composites. 4,578,287, Cl. 427-250.000.

Divjak, August A., Jr.; and Holdorf, Thomas C., to Johnson Service Company. Method for communicating binary data using modified frequency shift keying techniques. 4,578,798, Cl. 375-45.000.

Dr. Ing. h.c.F. Porsche AG: *See*—
Schibisch, Horst, 4,577,722, Cl. 180-315.000.

Dodds, David E., to Danby Systems Ltd. Telephone line interface circuit. 4,578,541, Cl. 179-18.0FA.

Doe, Susanne B.: *See*—
Holba, Albert G.; Doe, Susanne B.; and Hughes, William B., 4,577,492, Cl. 73-61.10C.

Doerr, Marvin L., to Celanese Corporation. Process for minimizing formation of low molecular weight oligomers during hydrolytic depolymerization of condensation polymers. 4,578,510, Cl. 562-483.000.

Dohadwalla, Alihussein N.: *See*—
Schorlemmer, Hans-Ulrich; Dickneite, Gerhard; Sedlacek, Hans-Harald; de Souza, Noel J.; and Dohadwalla, Alihussein N., 4,578,399, Cl. 514-455.000.

Dohi, Takashi: *See*—
Neki, Shigeo; Shinozaki, Nozomu; and Dohi, Takashi, 4,578,624, Cl. 318-305.000.

Dohi, Toshihide: *See*—
Yamakawa, Kazuo; and Dohi, Toshihide, 4,577,935, Cl. 350-432.000.

Doi, Muneharu: *See*—
Sumino, Yasuhiro; Sonoi, Koji; and Doi, Muneharu, 4,578,336, Cl. 435-88.000.

Dolling, Ulf H.; Pines, Seemon H.; and Grabowski, Edward J. J., to Merck & Co., Inc. Process for preparing a manipulated enantiomer mixture by asymmetric chiral phase transfer catalysis. 4,578,509, Cl. 562-462.000.

Domagala, John M.; and Schroeder, Mel C., to Warner-Lambert Company. Process for quinoline-3-carboxylic acid antibacterial agents. 4,578,473, Cl. 546-156.000.

Dompas, John M.: *See*—
Verhoeven, Constant T.; Tobback, Hubert J.; and Dompas, John M., 4,577,401, Cl. 29-825.000.

Donohue, James A., to Outboard Marine Corporation. CD ignition system with spark retard in neutral. 4,577,609, Cl. 123-602.000.

Dooley, John G. Pressure vessel testing. 4,577,487, Cl. 73-37.000.

Doran, William E. Construction block. 4,577,447, Cl. 52-571.000.

Doremus, Bernard, to Schlumberger Technology Corporation. Plug valve equipped with pressure equalization means. 4,577,662, Cl. 137-630.140.

Dorr, Wolfgang: *See*—
Assmann, Helmut; Dichtjar, Gerhard; Dorr, Wolfgang; Maier, Georg; Mathieu, Viktor; and Peehs, Martin, 4,578,229, Cl. 264-0.500.

Dorrn, Clive, to Imperial Chemical Industries, PLC. Production of PVC irrigation pipe and the pipe so produced. 4,577,998, Cl. 405-45.000.

Dotson, Charles E., to Completion Tool Company. Method for determining true fracture pressure. 4,577,689, Cl. 166-250.000.

Dotson, Ronald L.: *See*—
Miles, Ronald C.; Justice, David D.; and Dotson, Ronald L., 4,578,159, Cl. 204-98.000.

Doucet, Joel. Multicoin discriminator. 4,577,744, Cl. 194-318.000.

Douglas & Lomason Company: *See*—
Wright, Paul R.; and Hill, Dale A., 4,577,454, Cl. 53-492.000.

Dove, Derek B.: *See*—
Aviram, Ari; Dove, Derek B.; and Lane, Ramon, 4,577,983, Cl. 400-120.000.

Dove, Georges: *See*—
Giddey, Claude; and Dove, Georges, 4,578,278, Cl. 426-605.000.

Dow Chemical Company, The: *See*—
Ezzell, Bobby R.; Carl, William P.; and Mod, William A., 4,578,512, Cl. 562-586.000.
Hefner, Robert E., Jr., 4,578,439, Cl. 525-509.000.
McIntyre, James A.; Phillips, Robert F.; and Oswald, Max R., 4,578,162, Cl. 204-107.000.
Sawyer, Lawrence H.; and Knight, George W., 4,578,414, Cl. 524-310.000.

Dow Corning Corporation: *See*—
Elias, Michael G.; and Pullman, George D., 4,577,996, Cl. 405-17.000.
Groenhof, Eugene D., 4,577,523, Cl. 74-200.000.
Marko, Ollie W.; Steinmeyer, Robert D.; and Rentsch, Stefan, 4,578,494, Cl. 556-452.000.

Dower, Steven K.: *See*—
Urdal, David L.; March, Carl J.; and Dower, Steven K., 4,578,335, Cl. 435-68.000.

Dowrick, David C.; Hine, Edward K., Jr.; and Hine, Gregory S., to Hine-Snowbridge, Inc. Pannier bag having a clamping device with locking member. 4,577,786, Cl. 224-32.00A.

Drackett Company, The: *See*—
Delia, Anthony, 4,577,769, Cl. 215-211.000.

Draper, Charles W.; and Franks, Terry E., to Square D Company. Ground fault circuit interrupter including snap-acting contacts. 4,578,732, Cl. 361-45.000.

DrM Dr. Muller AG: *See*—
Muller, Hans, 4,578,197, Cl. 210-772.000.

Droscher, Bernhard; and Zitz, Alfred, to Voest-Alpine Aktiengesellschaft. Device for correcting the control or the display of the position of a cutting tool of a cutting machine. 4,578,627, Cl. 318-632.000.

Drucker, Alan S.; and Kwok, King H., to Carrier Corporation. Fan coil base pad assembly. 4,577,828, Cl. 248-678.000.

Druffel, James B.; and Cohen, Joel S., to Prescolite, Inc. Fastening device for fixing a body to a structural member. 4,577,824, Cl. 248-544.000.

D'Silva, Themistocles Damasceno J., to Union Carbide Corporation. Pesticidal alpha-cyanobenzyl phenyl benzoyl urea compounds. 4,578,402, Cl. 514-521.000.

DuBois, Chester G.; and Flaig, John D., to Outboard Marine Corporation. Carburetion system including an adjustable throttle linkage. 4,577,608, Cl. 123-583.000.

Dubois, Jean: *See*—
Roy, Jehan; and Dubois, Jean, 4,577,878, Cl. 280-242.0WC.

Ducret, Christian: *See*—
Bonino, Pierre; Ducret, Christian; and Mazzoleni, Cyrille, 4,577,893, Cl. 285-158.000.

Duke, B. Michael, to Harris Graphics Corporation. Stacking apparatus. 4,577,853, Cl. 271-217.000.

Duke, Steven R.: *See*—
Siemers, Paul A.; Kopp, Robert W.; Jackson, Melvin R.; Duke, Steven R.; Perrin, David P.; and Liu, Ying H., 4,577,431, Cl. 42-76.00A.

Dumas, Armand M.: *See*—
Mazumder, Ali T.; and Dumas, Armand M., 4,578,570, Cl. 235-463.000.

Duncan, Gary L., to Mobil Oil Corporation. Polymer film/polymer foam laminate and heat-resistant container fabricated therefrom. 4,578,297, Cl. 428-35.000.

Duncan, Lee H. Vehicle tow bar. 4,577,883, Cl. 280-491.00D.

Du Pont de Nemours, E. I., and Company: *See—*
Faulhaber, Mark E., 4,578,598, Cl. 307-271.000.
Hay, James V.; and Sauers, Richard F., 4,578,108, Cl. 71-93.000.
Krueger, Achim R., 4,578,418, Cl. 524-400.000.
Vasta, Joseph A., 4,578,286, Cl. 427-327.000.

Durand, Philippe, to Verrerie Cristallerie d'Arques J. G. Durand & Cie. Detachable handle including a spring-biased pivoting locking member. 4,577,367, Cl. 16-114.00A.

Durant, Graham J.; and Ganellin, Charon R., to SmithKline & French Laboratories Limited. Unsymmetrical guanidino, thioureido, isothioureido and nitromethyleneamino derivatives. 4,578,388, Cl. 514-252.000.

Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., to SmithKline & French Laboratories Limited. Heterocyclic alkylaminoheterocycles. 4,578,459, Cl. 544-8.000.

Duval, Michel: *See—*
Armand, Michel; Muller, Daniel; Duval, Michel; and Harvey, Paul-Etienne, 4,578,326, Cl. 429-192.000.

Dynamit Nobel Aktiengesellschaft: *See—*
Barfurth, Dieter; and Nestler, Heinz, 4,578,487, Cl. 556-40.000.
Schoengen, Anton; Schreiber, Georg; and Schroeder, Heinz, 4,578,501, Cl. 560-77.000.

Dysart, John K.; and Joffe, Frederick M., to Procter & Gamble Company, The. Composite waste-containment garment having disposable elasticized insert. 4,578,073, Cl. 604-397.000.

E. R. Squibb & Sons, Inc.: *See—*
Krapcho, John; and Wade, Peter C., 4,578,474, Cl. 546-188.000.

Eacobacci, Michael J.: *See—*
Olsen, Donald A.; and Eacobacci, Michael J., 4,577,465, Cl. 62-55.500.

Eaddy, John F., III. Biaryl aldehyde. 4,578,522, Cl. 568-425.000.

Eagle Industry Company Limited: *See—*
Ichimura, Masatoshi, 4,577,570, Cl. 112-121.120.

Eastman Kodak Company: *See—*
Borsenberger, Paul M.; Regan, Michael T.; and Staudenmayer, William J., 4,578,334, Cl. 430-59.000.
Freeman, John P.; Macon, Fred M.; and Mee, John D., 4,578,348, Cl. 430-607.000.
Gupta, Mool C.; and Stinson, Douglas G., 4,578,684, Cl. 346-135.100.
Hills, Robert G. C., 4,578,727, Cl. 360-102.000.
Jackson, Winston J., Jr.; and Watkins, Joseph J., 4,578,453, Cl. 528-302.000.
Light, Ronald R.; and Seymour, Robert W., 4,578,437, Cl. 525-444.000.
Meredith, Thomas D., Jr., 4,577,752, Cl. 206-83.500.
Regan, Michael T.; and Wright, Hal E., 4,578,330, Cl. 430-37.000.
Staudenmayer, William J.; Chen, Tsang J.; Borsenberger, Paul M.; and Grashof, Hans R., 4,578,333, Cl. 430-60.000.
Zoeller, Joseph R., 4,578,368, Cl. 502-28.000.

Eaton-Optimetrix, Inc.: *See—*
Phillips, Edward H., 4,577,957, Cl. 355-43.000.
Phillips, Edward H., 4,577,958, Cl. 355-43.000.

Eatwell, William D., to Camco, Incorporated. Nipple protector sleeve for use in a well conduit. 4,577,685, Cl. 166-115.000.

Eberbach, Steven J. Dihedral loudspeakers with variable dispersion circuits. 4,578,809, Cl. 381-99.000.

Ebisawa, Hiroo; Maruyama, Iwao; Fukuda, Masao; and Miyamoto, Shigeo, to Honda Giken Kogyo Kabushiki Kaisha. Method of partially painting an article using laser masking technique. 4,578,281, Cl. 427-53.100.

ebm Elektrobau Mulfingen GmbH & Co.: *See—*
Reinhardt, Wilhelm; and Rudele, Ulrich, 4,578,605, Cl. 310-67.00R.

Eckle, Otto, to Komet Stahlhalter-und Werkzeugfabrik Robert Breuning GmbH. Arrangement for supplying coolant to rotating cutting tools for metal machining, in particular boring tools, provided with coolant ducts. 4,578,003, Cl. 408-56.000.

Ecometal Limited: *See—*
Price, William F., 4,577,445, Cl. 52-403.000.

Economopoulos, Dennis O.; and Economopoulos, Othon. Locking filler tube cover apparatus for underground fuel tanks. 4,577,478, Cl. 70-168.000.

Economopoulos, Othon: *See—*
Economopoulos, Dennis O.; and Economopoulos, Othon, 4,577,478, Cl. 70-168.000.

Edge, Neil R. Musical drum. 4,577,541, Cl. 84-411.00R.

Edmo, Torbjorn; and Sehlstedt, Per-Olof, to Torbjorn Edmo AB. Lifting table. 4,577,821, Cl. 248-421.000.

Edwards, John H.: *See—*
Bott, David C.; Edwards, John H.; and Feast, William J., 4,578,443, Cl. 526-285.000.

Effland, Richard C.: *See—*
Allen, Richard C.; Effland, Richard C.; and Klein, Joseph T., 4,578,394, Cl. 514-332.000.

Efinger, Arnold, to Wickmann-Werke Boblingen GmbH. Electrical, medium voltage, switching mechanism. 4,578,550, Cl. 200-144.00B.

Eguchi, Kenzo; and Kobayashi, Jiro, to Taishin Electric Ind. Co., Ltd.; and Toshiba Medical Supply Co., Ltd. Steam generator. 4,578,563, Cl. 219-273.000.

Eheim, Franz, deceased: *See—*
Bohringer, Wilfried; Eheim, Franz, deceased; Fehlmann, Wolfgang; Laufer, Helmut; and Zibold, Karl, 4,577,606, Cl. 123-506.000.

Eheim, Helga, legal representative: *See—*
Bohringer, Wilfried; Eheim, Franz, deceased; Fehlmann, Wolfgang; Laufer, Helmut; and Zibold, Karl, 4,577,606, Cl. 123-506.000.

Eibofner, Eugen: *See—*
Mossle, Walter; and Eibofner, Eugen, 4,578,033, Cl. 433-29.000.

Eidenschink, Rudolf: *See—*
Praefcke, Klaus; Kohne, Bernd; Poules, Wadi; Eidenschink, Rudolf; and Scheubie, Bernhard, 4,578,210, Cl. 252-299.600.

Eilertsen, John L., to Giardini, Dante, a part interest. Solenoid actuators. 4,578,604, Cl. 310-30.000.

Eisai Co., Ltd.: *See—*
Tagaya, Ryosaku, 4,577,969, Cl. 356-394.000.

Elhaus, Friedrich W. Method of and a plant for preheating and, possibly, heat-treating and subsequently dividing rod-shaped material into slugs. 4,578,030, Cl. 432-18.000.

Eli Lilly and Company: *See—*
Spitzer, Wayne A., 4,578,387, Cl. 514-249.000.

Elias, Michael G.; and Pullman, George D., to Dow Corning Corporation. Method of controlling aquatic plant growth and silicone rubber benthic barriers. 4,577,996, Cl. 405-17.000.

Eliscu, Joshua, to Lois G. Langley. Camera holder apparatus. 4,577,827, Cl. 248-656.000.

Elkem A/S: *See—*
Sandvik, Johannes, 4,577,810, Cl. 242-157.100.

Elliott, Martin E.: *See—*
Wilson, Joseph H.; Rapp, Jeffrey C.; Southern, Brian K.; and Elliott, Martin E., 4,578,185, Cl. 210-85.000.

Elliott, Peter J.: *See—*
Betts, Alan J.; and Elliott, Peter J., 4,578,723, Cl. 360-77.000.

Elliott Turbomachinery Co., Inc.: *See—*
Idzik, Joseph J.; and Kouse, Charles H., 4,577,406, Cl. 30-103.000.

Elmis, Herbert; and Backes, Reiner, to ITT Industries, Inc. Digital circuit for synchronizing a pulse train. 4,578,705, Cl. 358-148.000.

Elrod, Harry F.: *See—*
Kraft, Douglas R.; and Elrod, Harry F., 4,578,782, Cl. 365-222.000.

Elscint Ltd.: *See—*
Crawford, Carl R.; Shimoni, Yair; Sohval, A. Robert; and Barnea, Daniel I., 4,578,753, Cl. 364-414.000.

Elvi S.p.A.: *See—*
Vicario, Guido F.; Vicario, Cesare; de Luca, Ugo; and Zelioli, Giuseppe, 4,578,169, Cl. 204-299.00R.

Emhart Industries, Inc.: *See—*
Anderson, Daniel J., 4,578,204, Cl. 252-62.200.
Jones, Stanley P., 4,578,104, Cl. 65-267.000.

EMI Limited: *See—*
Harwood, Alan R.; and Ward, Julie A., 4,577,513, Cl. 73-862.040.
Oliver, Colin C., 4,578,801, Cl. 378-19.000.

Emmett, John C.: *See—*
Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,578,459, Cl. 544-8.000.

Endo, Masaaki: *See—*
Shigemori, Daizo; Kunii, Haruo; and Endo, Masaaki, 4,578,733, Cl. 361-120.000.

Energaire Corporation: *See—*
Cole, George S., 4,577,417, Cl. 36-29.000.

Engel, Andreas; Schumann, Frank; Stiefel, Werner; and Freistedt, Reinhold, to VEB Kombinat Polygraph "Werner Lamberz" Leipzig. Method and apparatus to determine folding deviations. 4,578,052, Cl. 493-11.000.

Engelhard Corporation: *See—*
Amundsen, Alan R.; and Stern, Eric W., 4,578,490, Cl. 556-136.000.
Amundsen, Alan R.; and Stern, Eric W., 4,578,491, Cl. 556-137.000.
Huege, Fred R.; Slepetys, Richard A.; and Catone, David L., 4,578,118, Cl. 106-288.00B.

Engelmann, Albert C.: *See—*
Schoch, Donald C.; and Engelmann, Albert C., 4,578,318, Cl. 428-615.000.

Englund, Leif: *See—*
Bergstrom, Tommy; Boman, Goran; and Englund, Leif, 4,577,826, Cl. 248-638.000.

Enichimica S.p.A.: *See—*
Buonomo, Franco; Bellussi, Giuseppe; and Notari, Bruno, 4,578,161, Cl. 204-102.000.

Enomoto, Yoichi: *See—*
Murakami, Toshiaki; Enomoto, Yoichi; and Suzuki, Minoru, 4,578,691, Cl. 357-5.000.

Epson Corporation: *See—*
Kiyonaga, Bunzo, 4,577,931, Cl. 350-350.00R.

Equipment Company of America: *See—*
Kedem, Tuval, 4,577,463, Cl. 60-426.000.

Erckel, Rudiger: *See—*
Deger, Hans-Matthias; Erckel, Rudiger; and Fruhbeis, Horst, 4,578,469, Cl. 546-66.000.

Erickson, Donald C. Low energy high purity oxygen plus argon. 4,578,095, Cl. 62-22.000.

Erickson, Paul K.: *See—*
Smith, Joseph J.; and Erickson, Paul K., 4,577,717, Cl. 180-9.100.

Eriksson, Runar, to Oy Wartsila AB. Sliding door arrangement. 4,577,577, Cl. 114-120.000.

Erwin, Edward A., to AT&T Technologies, Inc. System for simultaneously programming a number of EPROMs. 4,578,751, Cl. 364-200.000.

ESCO Corporation: *See—*
Hahn, Frederick C., 4,577,423, Cl. 37-142.00R.

Etablissements Nativelle S.A.: *See—*
Jarreau, Francois X.; and Koenig, Jean-Jacques, 4,578,382, Cl. 514-245.000.
Etablissements Valois: *See—*
Brunet, Michel, 4,577,784, Cl. 222-402.200.
Ethicon, Inc.: *See—*
Weaver, Gregory A.; Price, Les[illegible]ritt, Crawford R.; and Shalaby, W. Shalaby, 4,578,451, [illegible].000.
Ethylene Corp.: *See—*
Sheridan, Michael, 4,578,170, Cl. 204-400.000.
Etienne, Jean-Luc; and Cruchon, Jean-Claude, to Thomson-CSF. Tuneable ultra-high frequency filter with mode TM010 dielectric resonators. 4,578,655, Cl. 333-202.000.
Everbrite Electric Signs, Inc.: *See—*
Trame, Charles E., 4,577,428, Cl. 40-518.000.
Everhart, Joseph R.; and Osborn, Jeffrey G., to AT&T Bell Laboratories. Encryption system key distribution method and apparatus. 4,578,531, Cl. 178-22.080.
Everman, Wayne F., to Container Corporation of America. Film tube gusset forming machine. 4,578,051, Cl. 493-8.000.
Evert, Karla R., to Stearns Manufacturing Company. Safety harness personal flotation device. 4,578,042, Cl. 441-117.000.
Ex-Cell-O Corporation: *See—*
Humphrey, William M., 4,578,447, Cl. 528-73.000.
Jackson, Theodore A., 4,577,546, Cl. 89-41.190.
Moore, James I., 4,577,670, Cl. 164-155.000.
Exacta S.p.A.: *See—*
Peloggio, Alessandro, 4,577,573, Cl. 112-318.000.
Extracorporeal Medical Specialties, Inc.: *See—*
King, Martin J.; and Troutner, Vernon H., 4,578,056, Cl. 604-6.000.
Exxon Production Research Co.: *See—*
Mifsud, Joseph F., 4,578,784, Cl. 367-143.000.
Exxon Research and Engineering Co.: *See—*
Bearden, Roby, Jr.; and Aldridge, Clyde L., 4,578,182, Cl. 208-112.000.
Best, Steven A., 4,578,374, Cl. 502-115.000.
Graves, Victoria, 4,578,373, Cl. 502-113.000.
Hoving, Klaas; and Walterbos, Johannes W. M., 4,578,372, Cl. 502-74.000.
Tiedje, J. Thomas, 4,578,641, Cl. 324-158.00D.
Ezzell, Bobby R.; Carl, William F.; and Mod, William A., to Dow Chemical Company, The. Process to produce novel fluorocarbon vinyl ethers and resulting polymers. 4,578,512, Cl. 562-586.000.
Ezzell, Robert C., to Phillips Petroleum Company. Method for cleaning heat exchangers. 4,577,677, Cl. 165-1.000.
F. F. Seeley Nominees Pty Ltd: *See—*
Kearney, Anthony D., 4,577,470, Cl. 62-259.400.
Fabricant, Robert N.; and Gangemi, Ronald J. Extra-capsular cataract surgery system. 4,578,059, Cl. 604-43.000.
Facal Garcia, Antonio. Anterior traction myotatic chin strap for the treatment of mandibular retrognathism. 4,577,627, Cl. 128-76.00R.
Fackelman, Lee E., to Glasstech, Inc. Glass sheet processing system including topside transfer apparatus. 4,578,103, Cl. 65-182.200.
Fagerlund, Bertil K. E. Process for digesting cellulosic material with heat recovery. 4,578,149, Cl. 162-39.000.
Faggin, Federico; Klein, Jerry A.; Yazolino, Lauren F.; Korody, Robert; Ha, Eric P. L.; and Kerman, Stephan, to International Remote Imaging Systems, Inc. Telecommunication apparatus serving as an interface between a digital computer and an analog communication medium. 4,578,537, Cl. 179-2.0DP.
Fairchild Camera & Instrument Corporation: *See—*
Santos, Joe, 4,578,594, Cl. 307-241.000.
Fairchild, James L.: *See—*
Puri, Avinash D.; Fairchild, James L.; and Rodosevich, James B., 4,578,086, Cl. 23-300.000.
Fang, Sheng; and Rao, Kameswara K., to Signetics Corporation. One step write circuit arrangement for EEPROMS. 4,578,777, Cl. 365-184.000.
Farrow, Robert I., to American Multimedia, Inc. Method and apparatus for testing the presence of magnetic storage medium on a given side of a tape. 4,578,644, Cl. 324-212.000.
Faudou, Jean-Yves; and Pelloux-Gervais, Pierre, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Method for manufacturing a sleeve, in particular for a container for storing a cryogenic fluid. 4,577,386, Cl. 29-455.00R.
Faulhaber, Mark E., to Du Pont de Nemours, E. I., and Company. Random pulse generator circuit. 4,578,598, Cl. 307-271.000.
Faulkner, Ben V., to Faulkner Oil Field Services, Inc. Method of preventing drill string overflow. 4,577,702, Cl. 175-65.000.
Faulkner Oil Field Services, Inc.: *See—*
Faulkner, Ben V., 4,577,702, Cl. 175-65.000.
Feast, William J.: *See—*
Bott, David C.; Edwards, John H.; and Feast, William J., 4,578,443, Cl. 526-285.000.
Fedi, Mauro: *See—*
Bonacchi, Graziano; Fedi, Mauro; and Giannini, Mario, 4,578,467, Cl. 544-360.000.
Fehlmann, Wolfgang: *See—*
Bohringer, Wilfried; Eheim, Franz, deceased; Fehlmann, Wolfgang; Laufer, Helmut; and Zibold, Karl, 4,577,606, Cl. 123-506.000.
Feichko, Joe: *See—*
Beesley, Robert S.; and Feichko, Joe, 4,577,383, Cl. 29-281.100.
Fellinger, Christine: *See—*
Tihanyi, Jeno ; Fellinger, Christine; and Leipold, Ludwig, 4,578,595, Cl. 307-252.00R.
Tihanyi, Jenoe ; Fellinger, Christine; and Leipold, Ludwig, 4,578,596, Cl. 307-252.00R.
Fenster, Larry A.; and Hostettler, Fritz, to Mercury Foam Corporation. Hair curler device. 4,577,647, Cl. 132-39.000.
Fenton, Donald M., to Union Oil Company of California. Lanthanum hydroxide and a rhodium or ruthenium moiety catalyst for homologation of alcohols. 4,578,375, Cl. 502-230.000.
Feramatic AG: *See—*
Reist, Walter, 4,577,855, Cl. 271-281.000.
Ferguson, Ian C., to Morganite Electrical Carbon Limited. Electric traction current-collector. 4,578,546, Cl. 191-87.000.
Ferrali, Luigi, to S.I.A.T.A. Societa Italiana Apparecchiature Trattamento Acqua S.p.A. Double multiple change-over valve, for controlling the operation of a water treatment plant. 4,577,498, Cl. 73-198.000.
Ferranti plc: *See—*
McPherson, Hugh, 4,578,603, Cl. 307-493.000.
Ferrari, Francis E.: *See—*
Grant, John W.; and Ferrari, Francis E., 4,578,574, Cl. 250-202.000.
Ferruzzi, Sergio: *See—*
Rossi, Pietro P.; Senni, Paolo; and Ferruzzi, Sergio, 4,578,511, Cl. 562-494.000.
Fessler, Herman S., to Cornelius Company, The. Beverage dispensing station. 4,577,782, Cl. 222-129.100.
Fichtel & Sachs AG: *See—*
Bergles, Eduard, 4,577,531, Cl. 74-781.00B.
Raab, Harald; and Gobel, Hilmar, 4,577,743, Cl. 192-106.200.
Fielding, Lawrence E., to United States of America, Air Force. Torque limiting collar. 4,577,891, Cl. 285-62.000.
Filliman, Mark D.: *See—*
Placke, Dale L.; Filliman, Mark D.; Granzow, Robert H.; Gross, Jack R.; and Nagy, Charles S., 4,577,763, Cl. 209-534.000.
Finn, Lawrence J.: *See—*
Hutchins, Burleigh M.; Buote, William J.; and Finn, Lawrence J., 4,578,764, Cl. 364-513.000.
Firestone Tire & Rubber Company, The: *See—*
Sicka, Richard W.; and Tompkins, Dale A., 4,578,024, Cl. 425-114.000.
Firmenich SA: *See—*
Morris, Anthony F.; Delay, Francois; Gautschi, Fritz; Thomas, Alan F.; Giersch, Wolfgang K.; and Boschung, Andre , 4,578,277, Cl. 426-538.000.
Fischer, Dan E. Controlled diffusion medicament applicator. 4,578,055, Cl. 604-2.000.
Fischer, Hermann, to M.A.N. Roland Druckmaschinen Aktiengesellschaft. Damping fluid application and metering apparatus for a printing machine. 4,577,556, Cl. 101-148.000.
Fischer, Hermann, to M.A.N. Roland Druckmaschinen Aktiengesellschaft. Ink application and metering apparatus for a printing machine. 4,577,557, Cl. 101-217.000.
Fischer, Hermann, to M.A.N. Roland Druckmaschinen Aktiengesellschaft. Ink metering apparatus for a printing machine. 4,577,558, Cl. 101-365.000.
Fishback, Alton J.: *See—*
Calvert, Rodney K.; and Fishback, Alton J., 4,577,745, Cl. 198-420.000.
Fisher, Robert W.; Maroone, James P.; Tipping, Donald W.; and Zanner, Frank J., to United States of America, Energy. Drop short control of electrode gap. 4,578,795, Cl. 373-70.000.
Fishing Designs, Inc.: *See—*
Brackett, John E.; and Dahlberg, Larry J., 4,577,432, Cl. 43-23.000.
Flaig, John D.: *See—*
DuBois, Chester G.; and Flaig, John D., 4,577,608, Cl. 123-583.000.
Fletcher, Thomas D.: *See—*
West, Jeffery A.; and Fletcher, Thomas D., 4,578,602, Cl. 307-475.000.
Flies, William P.; and Wehrmacher, William H., to Datakey, Inc. Portable electronic information devices and method of manufacture. 4,578,573, Cl. 235-492.000.
Floss, Josef G.: *See—*
Pipper, Gunter; Riegger, Siegfried; and Floss, Josef G., 4,578,455, Cl. 528-501.000.
Flowers, Dale R., to International Business Machines Corp. Remote indicating low battery voltage enunciator method and apparatus. 4,578,671, Cl. 340-636.000.
Floyd, William M.; and Juzswik, David L., to United Technologies Automotive, Inc. Control circuit for automotive accessory system. 4,578,591, Cl. 307-10.00R.
Flurry, Gregory A.: *See—*
Baker, David C.; Bantz, David F.; and Flurry, Gregory A., 4,578,674, Cl. 340-710.000.
Flynn, John J.: *See—*
Chai, Bruce H.; Buehler, Ernest; Flynn, John J.; and Morris, Robert C., 4,578,146, Cl. 156-623.00R.
FMC Corporation: *See—*
Linscheid, Denver D., 4,578,088, Cl. 55-2.000.
Folajtar, Donald A.: *See—*
Krishnan, Sivaram; Grigo, Ulrich R.; and Folajtar, Donald A., 4,578,409, Cl. 524-94.000.
Foltz, John V.: *See—*
Divecha, Amarnath P.; Karmarkar, Subhash D.; and Foltz, John V., 4,578,287, Cl. 427-250.000.
Fong, Wing C.; Fournier, Albert J.; and Gil, Bernard B., to Canada, The Government of. Gas sampling device. 4,577,518, Cl. 73-864.910.

Foote, Douglas C.; and Grinde, James E., to Yamaha Hatsudoki Kabushiki Kaisha. Off-the road vehicle for recreational and work applications. 4,577,712, Cl. 180-53.400.

Force Control Industries, Inc.: *See*—
Yater, Jerry L., 4,577,738, Cl. 192-18.00A.

Ford Aerospace & Communications Corporation: *See*—
Koehler, Charles W.; vanOmmering, Gerrit; and Puester, Neil H., 4,578,324, Cl. 429-26.000.

Ford, Michael E.: *See*—
Johnson, Thomas A.; and Ford, Michael E., 4,578,517, Cl. 564-479.000.

Ford Motor Company: *See*—
Laszlo, Hideg; and Koller, Paul L., 4,578,747, Cl. 364-151.000.
Ma, Thomas T., 4,577,598, Cl. 123-90.180.

Forell, Mark: *See*—
Kerr, Charles, III; and Forell, Mark, 4,578,617, Cl. 313-512.000.

Forester, David R., to Betz Laboratories, Inc. Method for controlling fouling deposit formation in a petroleum hydrocarbon or petrochemical. 4,578,178, Cl. 208-48.0AA.

Formosa, Daniel: *See*—
Maroti, Steven; and Formosa, Daniel, 4,577,550, Cl. 99-329.0RT.

Forner, Siegfried; Langhammer, Karl-Heinz; Pellkofer, Dieter; and Nahr, Wolfgang, to Kraftwerk Union Aktiengesellschaft. Device for overlay-welding pipes bends. 4,577,795, Cl. 228-29.000.

Foster, Diane: *See*—
Foster, Dwight R.; and Foster, Diane, 4,577,425, Cl. 40-19.000.

Foster, Dwight R.; and Foster, Diane, to Life Key Corporation. Information storage apparatus. 4,577,425, Cl. 40-19.000.

Foster, Gordon T., to Gulf & Western Manufacturing Company. Vacuum-packed survival equipment. 4,577,816, Cl. 244-148.000.

Four-Phase Systems, Inc.: *See*—
Desai, Anil I.; and Westerfeld, Eric C., 4,578,773, Cl. 364-900.000.

Fourie, Theunis G.; Dekker, Theodor G.; Snyckers, Friedrich O.; and van der Schyf, Cornelis J., to Noristan Limited. Phlorophenone derivatives, processes for preparing such compounds, uses and pharmaceutical compositions of phlorophenone compounds. 4,578,520, Cl. 568-315.000.

Fournier, Albert J.: *See*—
Fong, Wing C.; Fournier, Albert J.; and Gil, Bernard B., 4,577,518, Cl. 73-864.910.

Fowler, James D., to Monsanto Company. Fluid distribution system for separation modules. 4,578,190, Cl. 210-321.100.

Fox, Anthony G.; Smith, Harry L. O.; and Sadre-Marandi, Ehsan, to Beattie Systems, Inc. Film magazine. 4,577,947, Cl. 354-275.000.

Franchino, Michael R.: *See*—
Zell, John T., 4,577,612, Cl. 124-41.00A.

Francia Farmaceutici s.r.l.: *See*—
Francia, Giorgio A., 4,578,460, Cl. 544-49.000.

Francia, Giorgio A., to Francia Farmaceutici s.r.l. N-6-aminopurinyl-4-hydroxy-2-methyl-2H-1,2-benxothiazine-3-carboxamide 1,1-dioxide compound. 4,578,460, Cl. 544-49.000.

Frank, Arlen W., to United States of America, Agriculture. Process for the preparation of tris(N-carbalkoxylaminomethyl)phosphine oxides and sulfides. 4,578,506, Cl. 560-148.000.

Frank, Charles A.; and Compton, David J., to Automotive Products plc. Hydraulic cylinder provided with low friction plated internal surface. 4,577,549, Cl. 92-169.000.

Franke, John M., Sr., to Singer Company, The; and AVG Productions, Inc. Robotic work fabric manipulator. 4,577,792, Cl. 226-162.000.

Franklin Computer Corporation: *See*—
Yianilos, Peter N.; and Wajda, Michael L., 4,578,673, Cl. 340-703.000.

Franks, Terry E.: *See*—
Draper, Charles W.; and Franks, Terry E., 4,578,732, Cl. 361-45.000.

Franz, Helmut; Hanlon, James H.; and Shick, Lloyd G., to PPG Industries, Inc. Polymer solution working fluid for finishing processes. 4,578,203, Cl. 252-49.300.

Franz Viegener II, Firma: *See*—
Viegener, Walter, 4,577,353, Cl. 4-544.000.

Franz, Wiesner, to Traub GmbH. Tracing sensor. 4,577,416, Cl. 33-561.000.

Frauenfeld, Martin; and von Wedel, Rudiger, to Kraftanlagen AG. Storage material for heat transfer. 4,577,678, Cl. 165-10.000.

Frederick, Edward C., to Nike, Inc. Device for determining the speed, distance traversed, elapsed time and calories expended by a person while running. 4,578,769, Cl. 364-565.000.

Fredericksen, Arnold E.; and Richtmeyer, Robert D., to Torrington Company, The. Oscillating bearing. 4,577,911, Cl. 308-2.00R.

Freeman, John P.; Macon, Fred M.; and Mee, John D., to Eastman Kodak Company. Hydrolyzed azolium speed enhancing/fog-inhibiting agents for silver halide photography. 4,578,348, Cl. 430-607.000.

Freeport Minerals Company: *See*—
Astley, Vivian C.; Milan, Rudolph R.; and Taravella, Jody J., 4,577,804, Cl. 241-16.000.

Frei, Peter, to Patenver AG. Scaffold for the construction of round buildings of concrete or the like. 4,577,727, Cl. 182-128.000.

Freistedt, Reinhold: *See*—
Engel, Andreas; Schumann, Frank; Stiefel, Werner; and Freistedt, Reinhold, 4,578,052, Cl. 493-11.000.

French, James C.: *See*—
Stampwala, Suresh S.; French, James C.; Tunac, Josefino B.; Hurley, Timothy R.; and Bunge, Richard H., 4,578,383, Cl. 514-7.000.

Frerichs, Udo: *See*—
Seitz, Hans; Pieper, Henner; Frerichs, Udo; and Rach, Heinz-Dieter, 4,577,668, Cl. 152-520.000.

Freund, Bernhard: *See*—
Stricker, Herbert; Freund, Bernhard; Harwalik, Heribert; Rominger, Karl L.; Darda, Siegfried; Haselbarth, Volkmar; Arndts, Dietrich; Bechtel, Wolf D.; Bozler, Gerhard; Brickl, Rolf; and Gruber, Peter, 4,578,264, Cl. 424-37.000.

Frick, Roger L.: *See*—
Knecht, Thomas A.; Frick, Roger L.; and Schulte, John P., 4,578,735, Cl. 361-283.000.

Frickel, Fritz-Frieder; and Nuerrenbach, Axel, to BASF Aktiengesellschaft. Phenylethylene derivatives and their use as drugs. 4,578,498, Cl. 560-8.000.

Frieder, Philip M.; and de Rojas, Edward, to Optical Systems International, Inc. Laminated high correction eyeglass lens. 4,577,942, Cl. 351-159.000.

Friedman, Bernard, to Oil Process Systems, Inc. Method and system for filtering cooking oil. 4,578,196, Cl. 210-765.000.

Friedrich, Paul: *See*—
Jestrich, Hans-Achim; and Friedrich, Paul, 4,577,505, Cl. 73-629.000.

Frischknecht, Bruno; and Wurgler, Rolf, to Swiss Aluminium Ltd. Device for manufacturing metal strip. 4,577,672, Cl. 164-428.000.

Fritschi, Edgar: *See*—
Satzinger, Gerhard; Barth, Hubert; Hartenstein, Johannes; Herrmann, Manfred; Fritschi, Edgar; and Schutt, Ilse-Dore, 4,578,380, Cl. 514-232.000.

Frohberger, Paul-Ernst: *See*—
Jager, Gerhard; Bockmann, Klaus; Buchel, Karl H.; Brandes, Wilhelm; Frohberger, Paul-Ernst; and Scheinpflug, Hans, 4,578,396, Cl. 514-383.000.

Fromentin, Jean: *See*—
Braud, Yves; and Fromentin, Jean, 4,578,011, Cl. 414-152.000.

Fruhbeis, Horst: *See*—
Deger, Hans-Matthias; Erckel, Rudiger; and Fruhbeis, Horst, 4,578,469, Cl. 546-66.000.

Fryc, Oldrich: *See*—
Armstrong, Thomas E.; Boob, Douglas L.; Burrous, Homer R.; Fryc, Oldrich; and Wagner, David L., 4,577,794, Cl. 227-119.000.

Fuchigami, Tadashi: *See*—
Nishida, Susumu; Kimura, Seiji; Kobayashi, Akio; and Fuchigami, Tadashi, 4,577,915, Cl. 312-214.000.

Fuji Photo Film Co., Ltd.: *See*—
Arai, Fuminori; Inagaki, Yoshio; and Kitajima, Masao, 4,578,245, Cl. 422-56.000.
Ishikuro, Tadashi; Shirahata, Ryuji; Miyoshi, Takahito; and Fujiyama, Masaaki, 4,578,311, Cl. 428-336.000.
Kato, Mikihiko; Okita, Tsutomu; Komine, Shigeo; Okuzawa, Yasutoshi; and Morita, Kazuhiko, 4,578,299, Cl. 428-65.000.
Noguchi, Masaru, 4,578,577, Cl. 250-235.000.
Ohno, Shigeru; Kishimoto, Shinzo; Ikegawa, Akihiko; and Yagihara, Morio, 4,578,345, Cl. 430-393.000.
Sekiya, Toshiyuki, 4,578,342, Cl. 430-159.000.
Seshimoto, Osamu; and Nirasawa, Mitsuharu, 4,578,173, Cl. 204-416.000.
Takahashi, Yutaka; and Matsuoka, Hiroshi, 4,577,951, Cl. 354-331.000.
Takano, Masao, 4,578,582, Cl. 250-327.200.
Tanaka, Hiroshi; and Kato, Hisatoyo, 4,578,581, Cl. 250-327.200.
Tanaka, Yasunori; and Noda, Shinji, 4,577,362, Cl. 15-256.500.
Terashita, Takaaki, 4,577,961, Cl. 355-77.000.
Watanabe, Toshiyuki; Yagihara, Morio; and Adachi, Keiichi, 4,578,346, Cl. 430-548.000.

Fuji Xerox Co., Ltd.: *See*—
Satoh, Takane; and Tan, Yoichi, 4,578,797, Cl. 375-25.000.
Takeyama, Kokichi; Sugawara, Kiyoshi; and Fukagawa, Yasuyuki, 4,577,850, Cl. 271-22.000.

Fujii, Kozo; and Okumura, Takeo, to Kao Corporation. Shampoo composition containing amino acid-anionic and amphoteric surface active agents. 4,578,216, Cl. 252-542.000.

Fujii, Shigeru, to Fujitsu Limited. Voltage dividing circuit. 4,578,772, Cl. 364-850.000.

Fujii, Takeo: *See*—
Takahashi, Yukoh; Fujii, Takeo; Shionoya, Masahisa; Yachigo, Shinichi; and Ishii, Tamaki, 4,578,410, Cl. 524-102.000.
Yoshimura, Masakatsu; Fujii, Takeo; Yachigo, Shinichi; and Ishii, Tamaki, 4,578,472, Cl. 546-188.000.

Fujii, Yasufumi: *See*—
Sakagami, Teruo; Fujii, Yasufumi; and Murayama, Naohiro, 4,578,445, Cl. 526-292.300.

Fujimori, Hiroshi: *See*—
Suzuki, Takashi; Fujimori, Hiroshi; and Odagiri, Masaru, 4,578,729, Cl. 360-134.000.

Fujimoto, Terunori: *See*—
Shimizu, Nobuyoshi; Fujimoto, Terunori; Inui, Tsuneo; and Ishida, Masatoki, 4,578,319, Cl. 428-632.000.

Fujimura, Toshio: *See*—
Shimizu, Keizo; Otsu, Shimpei; Fujimura, Toshio; Taniguchi, Yoshisada; and Nagami, Hayashi, 4,578,787, Cl. 369-77.200.

Fujisawa, Kyuichi: *See*—
Tanaka, Hideto; and Fujisawa, Kyuichi, 4,578,685, Cl. 346-139.00R.

Fujisawa Pharmaceutical Co., Ltd.: *See*—
Kiyoto, Sumio; Nishikawa, Motoaki; Iwami, Morita; Terano, Hiroshi; and Kohsaka, Masanobu, 4,578,271, Cl. 424-117.000.

Fujisawa, Tetsuo, to Kabushiki Kaisha Kobe Seiko Sho. Method for driving a rotary kiln for roasting cement raw meals. 4,577,029, Cl. 432-14.000.

Fujita, Hiroo, to Citizen Watch Co., Ltd. Surface shape measurement apparatus. 4,577,967, Cl. 356-349.000.

Fujita, Takeyuki: *See*—
Ashina, Yoshiro; Fujita, Takeyuki; Fukatsu, Michio; and Yagi, Junsuke, 4,578,516, Cl. 564-479.000.

Fujitsu Limited: *See*—
Aoyama, Keizo, 4,578,778, Cl. 365-190.000.
Baba, Fumio, 4,578,780, Cl. 365-190.000.
Fujii, Shigeru, 4,578,772, Cl. 364-850.000.
Hanada, Koji; Kinoshita, Yuji; and Tamura, Masaru, 4,578,660, Cl. 335-133.000.
Kosemura, Kinjiro; Yamashita, Yoshimi; Nakayama, Noriaki; and Yamamoto, Sumio, 4,578,343, Cl. 430-296.000.
Ogawa, Junji; Nakano, Tomio; Nakano, Masao; Tsuge, Norihisa; and Horii, Takashi, 4,578,781, Cl. 365-203.000.
Takemae, Yoshihiro, 4,578,697, Cl. 357-75.000.
Takemae, Yoshihiro; Nakano, Tomio; and Sato, Kimiaki, 4,578,776, Cl. 365-149.000.

Fujiwara, Kunio: *See*—
Tanaka, Gotaro; Fujiwara, Kunio; and Miyajiri, Tetsuo, 4,578,560, Cl. 219-121.0PR.

Fujiyama, Masaaki: *See*—
Ishikuro, Tadashi; Shirahata, Ryuji; Miyoshi, Takahito; and Fujiyama, Masaaki, 4,578,311, Cl. 428-336.000.

Fukagawa, Yasuyuki: *See*—
Takeyama, Kokichi; Sugawara, Kiyoshi; and Fukagawa, Yasuyuki, 4,577,850, Cl. 271-22.000.

Fukao, Takahisa: *See*—
Omae, Yoshihiro; Ishikawa, Kunio; Fukao, Takahisa; and Yoshida, Katsushige, 4,577,385, Cl. 29-402.180.

Fukasawa, Yoshiro, to Japan Spectroscopic Co., Ltd. Spectrophotometer. 4,577,966, Cl. 356-325.000.

Fukatsu, Michio: *See*—
Ashina, Yoshiro; Fujita, Takeyuki; Fukatsu, Michio; and Yagi, Junsuke, 4,578,516, Cl. 564-479.000.

Fukuda, Masao, to Kabushiki Kaisha Ishida Koki Seisakusho. Method of and apparatus for combinatorial computation. 4,577,707, Cl. 177-25.000.

Fukuda, Masao: *See*—
Ebisawa, Hiroo; Maruyama, Iwao; Fukuda, Masao; and Miyamoto, Shigeo, 4,578,281, Cl. 427-53.100.

Fukui, Kiyoshi; Kakeya, Noboru; and Taguchi, Mitsushi, to Ube Industries, Ltd. Process for preparing 1,2,4-triazole-3-carboxamides. 4,578,479, Cl. 548-269.000.

Fukuoka, Masayuki: *See*—
Saito, Shigeakira; and Fukuoka, Masayuki, 4,578,327, Cl. 429-194.000.

Fukushima, Kiyoto: *See*—
Ohta, Hiroshi; Abe, Shinji; and Fukushima, Kiyoto, 4,578,314, Cl. 428-403.000.

Fukuzawa, Manami: *See*—
Soneda, Mitsuo; Fukuzawa, Manami; and Ohtsu, Takaji, 4,578,597, Cl. 307-265.000.

Furst, Andor; Muller, Marcel; Kerb, Ulrich; and Wiechert, Rudolf, to Hoffman-La Roche Inc. Novel D-homosteroids. 4,578,475, Cl. 548-126.000.

Furukawa, Hisao; Okada, Keiko; Kawamura, Joe; and Kato, Yasushi, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Stabilized moisture curable composition. 4,578,417, Cl. 524-378.000.

Furuya, Yukitsuna: *See*—
Yasuda, Yutaka; Hirata, Yasuo; Murakami, Shuji; Nakamura, Katsuhiro; and Furuya, Yukitsuna, 4,578,800, Cl. 375-106.000.

Fusco, Frank. Vestibule for any stove. 4,577,617, Cl. 126-279.000.

Fuse, Genzo; Abe, Kaoru; and Matsumoto, Isao, to Honda Giken Kogyo Kabushiki Kaisha. Machining reforming apparatus for electrode of resistance welding machine. 4,578,005, Cl. 409-140.000.

G. D. Searle & Co.: *See*—
Collins, Paul W.; and Weier, Richard M., 4,578,505, Cl. 560-118.000.

GA Technologies Inc.: *See*—
Yampolsky, Jack S.; and Carosella, David P. E., Jr., 4,577,682, Cl. 165-160.000.

GAF Corporation: *See*—
Amabile, Robert N.; Judd, Richard E.; and Gromelski, Stanley J., Jr., 4,578,407, Cl. 524-55.000.

Gaillard, Daniel: *See*—
Andriessen, Johannes; and Gaillard, Daniel, 4,578,731, Cl. 361-42.000.

Galkin, Benjamin M. Volume reduction in liquid scintillation counting. 4,578,588, Cl. 250-432.00R.

Ganellin, Charon R.: *See*—
Durant, Graham J.; and Ganellin, Charon R., 4,578,388, Cl. 514-252.000.
Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,578,459, Cl. 544-8.000.

Gangemi, Ronald J.: *See*—
Fabricant, Robert N.; and Gangemi, Ronald J., 4,578,059, Cl. 604-43.000.

Gardiner, Thomas: *See*—
Currie, Brian; Gardiner, Thomas; and Green, Henry M., 4,578,301, Cl. 428-109.000.

Garner, John N., to Northern Telecom Limited. Manufacture of telecommunications cable core units. 4,577,403, Cl. 29-872.000.

Garnsworthy, Russell K., to Commonwealth Scientific and Industrial Research Organization. Joining of yarns by pneumatic splicing. 4,577,458, Cl. 57-22.000.

Garrett Corporation, The: *See*—
McCarty, Frederick B., 4,578,609, Cl. 310-156.000.
Safarik, William F., 4,578,019, Cl. 416-1.000.

Garrett, Steven L.: *See*—
Migliori, Albert; Swift, Gregory W.; and Garrett, Steven L., 4,577,414, Cl. 33-363.00K.

Gassmann, Zean Z.; Hawkins, Jeffrey T.; and Brown, Alfred, to Texaco Inc. Injection of steam foaming agents into producing wells. 4,577,688, Cl. 166-245.000.

Gaube, Franz: *See*—
Schultz, Ludwig; and Gaube, Franz, 4,578,123, Cl. 148-11.50Q.

Gautheron, Lucien. Extruded section for swimming pool rollable cover. 4,577,352, Cl. 4-499.000.

Gautier, Jean P., to Societe Anonyme D.B.A. Servomotor for braking assistance. 4,577,548, Cl. 91-369.00A.

Gautschi, Fritz: *See*—
Morris, Anthony F.; Delay, Francois; Gautschi, Fritz; Thomas, Alan F.; Giersch, Wolfgang K.; and Boschung, Andre , 4,578,277, Cl. 426-538.000.

Gavronski, Paul A.: *See*—
Oshefsky, Daniel J.; Gavronski, Paul A.; Vogt, Robert E.; and Rajala, Gregory J., 4,578,133, Cl. 156-164.000.

Gehly, Joel C.: *See*—
Klein, Roy S.; Gehly, Joel C.; and Sestak, Joseph T., 4,578,742, Cl. 362-294.000.

Geiger, Kenneth E.: *See*—
Nitzsche, Raymond P.; and Geiger, Kenneth E., 4,577,630, Cl. 128-314.000.

Geke, Juergen; and Stedry, Bernd, to Henkel Kommanditgesellschaft auf Aktien. Compositions and processes for cleaning and passivating metals. 4,578,208, Cl. 252-135.000.

Gelbart, Daniel, to Creo Electronics Corporation. Multi-spot modulator using a laser diode. 4,577,932, Cl. 350-358.000.

Gelfand, Valery A., to Western Geophysical Company of America. Two-component acoustic borehole tool. 4,578,785, Cl. 367-35.000.

Gelles, Richard: *See*—
Gergen, William P.; Lutz, Robert G.; and Gelles, Richard, 4,578,429, Cl. 525-291.000.

Gembus, Hans-Dieter; and Wolf, Rainer, to Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH. Coupling arrangement for pipe conduits conducting a medium containing radioactive substances. 4,577,659, Cl. 137-614.060.

General Dynamics Electronics Division: *See*—
Mathis, Ronald F., 4,577,924, Cl. 350-96.150.

General Electric Company: *See*—
Cardwell, John G., Jr., 4,578,616, Cl. 313-579.000.
Corby, Nelson R., Jr.; and Godwin, Stanley J., 4,578,561, Cl. 219-124.340.
Grass, Joseph J.; Glyzewski, Marvin P.; and Polizzi, Emanuel V., 4,578,806, Cl. 378-162.000.
Griffing, Bruce F.; and West, Paul R., 4,578,344, Cl. 430-312.000.
Highton, Frederick J., 4,578,820, Cl. 455-154.000.
Howell, Edward K., 4,578,653, Cl. 333-166.000.
Huseby, Irvin C.; and Bobik, Carl F., 4,578,232, Cl. 264-65.000.
Huseby, Irvin C.; and Bobik, Carl F., 4,578,233, Cl. 264-65.000.
Huseby, Irvin C.; and Bobik, Carl F., 4,578,234, Cl. 264-65.000.
Huseby, Irvin C.; and Bobik, Carl F., 4,578,364, Cl. 501-98.000.
Huseby, Irvin C.; and Bobik, Carl F., 4,578,365, Cl. 501-98.000.
Kliman, Gerald B.; and Plunkett, Allan B., 4,578,610, Cl. 310-156.000.
Kray, William D., 4,578,328, Cl. 430-18.000.
Laughton, William J., 4,578,632, Cl. 323-315.000.
Mobley, David P., 4,578,449, Cl. 528-212.000.
Pope, Adam N., 4,578,018, Cl. 415-14.000.
Pratt, Sandra L.; Lucas, Gary M.; and Zembayashi, Michio, 4,578,492, Cl. 556-407.000.
Rabatin, Jacob G., 4,578,211, Cl. 252-301.40H.
Rowe, Raymond G., 4,578,129, Cl. 148-407.000.
Schoenig, Frederick C., Jr.; and Grossman, Leonard N., 4,577,565, Cl. 110-237.000.
Sehgal, Tyag R., 4,577,501, Cl. 73-577.000.
Siemers, Paul A.; Kopp, Robert W.; Jackson, Melvin R.; Duke, Steven R.; Perrin, David P.; and Liu, Ying H., 4,577,431, Cl. 42-76.00A.
Webb, Jimmy L., 4,578,470, Cl. 546-256.000.

General Motors Corporation: *See*—
Sharma, Ram A., 4,578,242, Cl. 420-590.000.

Genovese, Frank C.; and Lannom, James W., to Xerox Corporation. Vacuum fluorescent printing device employing a fly's-eye light coupling method. 4,578,615, Cl. 313-497.000.

Geo-Centers, Inc.: *See*—
Griffith, James R.; and O'Rear, Jacques G., 4,578,508, Cl. 560-221.000.

Georg Fischer Aktiengesellschaft: *See*—
Brenner, Peter, 4,577,441, Cl. 51-419.000.

Georg Rost und Soehne Armaturenfabrik GmbH und Co. KG.: *See*—
Strangfeld, Reiner, 4,577,829, Cl. 251-15.000.

Gerber, Jerome J. Implement hitch assembly. 4,577,881, Cl. 280-412.000.

Gergen, William P.; Lutz, Robert G.; and Gelles, Richard, to Shell Oil Company. Selectively hydrogenated block copolymers modified with acid compounds or derivatives. 4,578,429, Cl. 525-291.000.

Gerhardy, Reinhard, to Andreas Stihl. Carburetor for an internal combustion engine. 4,578,228, Cl. 261-41.00D.

Gerretz, Josef: *See—*
Rehag, Klaus; and Gerretz, Josef, 4,577,483, Cl. 72-214.000.

Gerschler, Lutz J.: *See—*
Lindorfer, Walter; Jahn-Held, Wilhelm; Gerschler, Lutz J.; Jandel, Berthold; and Wartenpfuhl, Friedel, 4,577,999, Cl. 405-53.000.

Geschwender, Robert C., to New Products I, Inc. Knockdown rack. 4,577,767, Cl. 211-190.000.

Gessman, Lawrence J. Method and apparatus for alleviating paroxysmal atrail tachycardia. 4,577,634, Cl. 128-419.0PG.

Getman, Daniel P., to Monsanto Company. Synthesis of sulfilimines. 4,578,514, Cl. 564-102.000.

Geyken, Erwin; Heckl, Franz; Kastl, Alfons; Lehnert, Klaus; and Loistl, Rudolf, to Agfa-Gevaert AG. Developing device for a horizontally, transported photographic layer carrier. 4,577,949, Cl. 354-319.000.

Gharavi, Hamid, to AT&T Bell Laboratories. Image coding technique. 4,578,704, Cl. 358-135.000.

Giannini, Mario: *See—*
Bonacchi, Graziano; Fedi, Mauro; and Giannini, Mario, 4,578,467, Cl. 544-360.000.

Giardini, Dante: *See—*
Eilertsen, John L., 4,578,604, Cl. 310-30.000.

Gibbons, Ian: *See—*
Armenta, Richard D.; and Gibbons, Ian, 4,578,350, Cl. 435-7.000.

Giddey, Claude; and Dove, Georges, to Battelle Memorial Institute. Lighter foodstuffs and method for preparation of such products. 4,578,278, Cl. 426-605.000.

Gidge, Lester; and Murro, Ronald P., to Bay Mills Limited. Weft forming apparatus. 4,578,141, Cl. 156-439.000.

Giersch, Wolfgang K.: *See—*
Morris, Anthony F.; Delay, Francois; Gautschi, Fritz; Thomas, Alan F.; Giersch, Wolfgang K.; and Boschung, Andre , 4,578,277, Cl. 426-538.000.

Giessler, Klaus: *See—*
Richter, Ekkehard; Korbacher, Werner; Knoblauch, Karl; Giessler, Klaus; and Harder, Klaus-Burkhard, 4,578,089, Cl. 55-26.000.

Gil, Bernard B.: *See—*
Fong, Wing C.; Fournier, Albert J.; and Gil, Bernard B., 4,577,518, Cl. 73-864.910.

Gilda, Patricia; Mann, William F.; and Allen, Winthrop D., III. Ashtray. 4,577,758, Cl. 206-496.000.

Gill, Roger F.; and Narasimham, Pundi L., to AT&T Technologies, Inc. Methods of and apparatus for recovering a constituent of a process effluent. 4,578,253, Cl. 423-87.000.

Gillespie, John R.; and Corley, Daniel M., to Gillespie & Powers, Inc. Furnace and process for providing a source of molten metal. 4,578,111, Cl. 75-65.00R.

Gillespie & Powers, Inc.: *See—*
Gillespie, John R.; and Corley, Daniel M., 4,578,111, Cl. 75-65.00R.

Gionet, Daniel C.; and Nguyen, Harry V., to Lanson Electronics, Inc. Automatic door object sensing system. 4,577,437, Cl. 49-25.000.

Giravions Dorand: *See—*
de Guillenschmidt, Pierre; Hubert, Jacques; Goujon, Michel; and Saunier, Christian, 4,577,962, Cl. 356-5.000.

Gironde, Daniel: *See—*
Mech, Christian; and Gironde, Daniel, 4,578,608, Cl. 310-112.000.

Gizeh-Werk GmbH: *See—*
Kresin, Hermann, 4,577,775, Cl. 220-66.000.

GKN-Stenman AB: *See—*
Widen, Bo, 4,577,479, Cl. 70-364.00A.

Glass, Ted A. Bean bag body support. 4,577,358, Cl. 5-455.000.

Glasstech, Inc.: *See—*
Fackelman, Lee E., 4,578,103, Cl. 65-182.200.

Glaxo Group Limited: *See—*
Phillipps, Gordon H.; Bain, Brian M.; and Laing, Stuart B., 4,578,221, Cl. 260-397.100.

Gleason, Harold T. Hay bale loader. 4,578,008, Cl. 414-24.500.

Glyco-antriebstechnik GmbH: *See—*
Cyphelly, Ivan J., 4,577,739, Cl. 192-61.000.

Glyzewski, Marvin P.: *See—*
Grass, Joseph J.; Glyzewski, Marvin P.; and Polizzi, Emanuel V., 4,578,806, Cl. 378-162.000.

Go, Santos W., deceased (by Yager, John W., administrator); and Jabarin, Saleh A., to Owens-Illinois, Inc. Ethylene polymer blend and containers prepared therefrom. 4,577,768, Cl. 215-1.00C.

Gobel, Hilmar: *See—*
Raab, Harald; and Gobel, Hilmar, 4,577,743, Cl. 192-106.200.

Godwin, Stanley J.: *See—*
Corby, Nelson R., Jr.; and Godwin, Stanley J., 4,578,561, Cl. 219-124.340.

Goel, Anil B., to Ashland Oil, Inc. High performance two-component epoxy structural adhesives with chemical thixotropy. 4,578,424, Cl. 525-109.000.

Goldberg, Erwin; and Wheat, Thomas E., to Northwestern University. Antigenic peptide compound. 4,578,219, Cl. 260-112.50R.

Goldberg, Harris A.: *See—*
Kalnin, Ilmar L.; Goldberg, Harris A.; and Williams, Clyde C., 4,577,979, Cl. 374-178.000.

Goldstake: *See—*
Lang, Paul W.; and Gribshaw, Franklin C., 4,578,709, Cl. 358-230.000.

Goldstein, Amnon: *See—*
Spencer, David R.; and Goldstein, Amnon, 4,578,689, Cl. 346-160.000.

Gollub, Erwin; and Muller, Reinhardt, to TRW Ehrenreich GmbH & Co., KG. Ball joint. 4,577,988, Cl. 403-140.000.

Gomei, Yoshio, to Tokyo Shibaura Denki Kabushiki Kaisha. Torus type nuclear fusion apparatus using deuterium or tritium as fuel. 4,578,236, Cl. 376-136.000.

Goodman, Joseph J.: *See—*
Carter, Guy T.; Borders, Donald B.; Goodman, Joseph J.; and Labeda, David P., 4,578,468, Cl. 546-35.000.

Goodyear Tire & Rubber Company, The: *See—*
Budd, William; and Sandstrom, Paul H., 4,578,411, Cl. 524-156.000.
McKinney, Robert L., 4,577,412, Cl. 33-172.00R.
Schloman, William W., Jr., 4,578,450, Cl. 528-254.000.

Gordon, James F., to Nicolet Instrument Corporation. Graphic recording system. 4,578,683, Cl. 346-49.000.

Gorin, Everett, to Conoco Inc. Combined process for coal pyrolysis and char gasification. 4,578,175, Cl. 208-8.00R.

Gosis, Anatoly I.; and Bartos, Frank J., to Siemens Gammasonics, Inc. Detector head mounting mechanism. 4,578,585, Cl. 250-363.00S.

Gossard, Arthur C.; Miller, Robert C.; and Petroff, Pierre M., to AT&T Bell Laboratories. Method of making an improved group III-V semiconductor device utilizing a getter-smoothing layer. 4,578,127, Cl. 148-175.000.

Gossett, Burnham N. In-place swimming apparatus. 4,577,859, Cl. 272-71.000.

Gotou, Tadashi; Kawamura, Fumio; Sagawa, Norihiko; and Yusa, Hideo, to Hitachi, Ltd. Power storage system using sodium-sulfur batteries. 4,578,325, Cl. 429-91.000.

Gottling, Helmut, to WABCO Westinghouse Steuerungstechnik GmbH. Brake apparatus to retard relative movement between two members. 4,577,732, Cl. 188-67.000.

Goujon, Michel: *See—*
de Guillenschmidt, Pierre; Hubert, Jacques; Goujon, Michel; and Saunier, Christian, 4,577,962, Cl. 356-5.000.

Gould, Clive M.: *See—*
Callaghan, Ian C.; and Gould, Clive M., 4,577,491, Cl. 73-60.100.

Govekar, Craig F.: *See—*
Quinn, Robert O.; Govekar, Craig F.; and Piehl, James R., 4,578,755, Cl. 364-431.010.

Grabowski, Edward J. J.: *See—*
Dolling, Ulf H.; Pines, Seemon H.; and Grabowski, Edward J. J., 4,578,509, Cl. 562-462.000.

Grachek, Bruce: *See—*
Berg, Marvin; and Grachek, Bruce, 4,577,837, Cl. 254-212.000.

Grade, Reinhardt: *See—*
Wenner, Wolfgang; and Grade, Reinhardt, 4,578,489, Cl. 556-100.000.

Graham, John R., to Biomedical Concepts, Inc. Esophageal stethoscope. 4,577,638, Cl. 128-671.000.

Gramss, Rainer: *See—*
Wiese, Heiner; and Gramss, Rainer, 4,577,904, Cl. 297-410.000.

Grandon, Stanley C. Intraocular catheter apparatus and method of use. 4,578,058, Cl. 604-27.000.

Grant, John W.; and Ferrari, Francis E., to Stewart-Warner Corporation. Pattern tracer with variable effective forward offset and method. 4,578,574, Cl. 250-202.000.

Grant, Robert J. Vehicle armrest. 4,577,905, Cl. 297-411.000.

Grant, Spencer H. Tree trimming apparatus. 4,577,457, Cl. 56-235.000.

Granzow, Robert H.; Daulton, Richard H.; Placke, Dale L.; Adelberger, Donald L.; Gross, Jack R.; and Nagy, Charles S., to NCR Corporation. Collector and carriage mechanism for use in a sheet dispenser. 4,578,009, Cl. 414-43.000.

Granzow, Robert H.; Gupta, Desh B.; and Myers, Kimbrough I., to NCR Corporation. Method and apparatus for gaining access to a system having controlled access thereto. 4,578,567, Cl. 235-380.000.

Granzow, Robert H.: *See—*
Placke, Dale L.; Filliman, Mark D.; Granzow, Robert H.; Gross, Jack R.; and Nagy, Charles S., 4,577,763, Cl. 209-534.000.

Grapha-Holding AG: *See—*
Grunder, Roland, 4,577,852, Cl. 271-188.000.

Graser, James A. Wireline apparatus. 4,577,693, Cl. 166-338.000.

Grashof, Hans R.: *See—*
Staudenmayer, William J.; Chen, Tsang J.; Borsenberger, Paul M.; and Grashof, Hans R., 4,578,333, Cl. 430-60.000.

Grass, Joseph J.; Glyzewski, Marvin P.; and Polizzi, Emanuel V., to General Electric Company. Device for aligning cooperating X-ray systems. 4,578,806, Cl. 378-162.000.

Grasset, Joseph. Article for infants, forming pacifier and teething ring simultaneously. 4,577,632, Cl. 128-360.000.

Graves, Victoria, to Exxon Research & Engineering Co. Polymerization catalyst system. 4,578,373, Cl. 502-113.000.

Gravley, Wilton: *See—*
Dellinger, Thomas B.; and Gravley, Wilton, 4,577,701, Cl. 175-61.000.

Gray, Henry F.; and Greene, Richard F., to United States of America, Navy. Ultra-fast field emitter array vacuum integrated circuit switching device. 4,578,614, Cl. 313-309.000.

Gray, Kevin; and Johnson, Frederic A., to Johnson, Frederic A. Log splitting device. 4,577,667, Cl. 144-193.00C.

Gray, Michael A., to AT&T Bell Laboratories. Separating an equivalent circuit into components to detect terminating networks. 4,578,761, Cl. 364-481.000.

Gray, Stanley J., to Borg-Warner Corporation. Impeller under file machine. 4,578,006, Cl. 409-303.000.

Green, Henry M.: *See*—
Currie, Brian; Gardiner, Thomas; and Green, Henry M., 4,578,301, Cl. 428-109.000.

Green, John G., II. Small gliding underwater craft. 4,577,583, Cl. 114-332.000.

Greenberger, Joseph I., to Wean United, Inc. Method and apparatus for treating work rolls in a rolling mill. 4,577,482, Cl. 72-201.000.

Greene, Richard F.: *See*—
Gray, Henry F.; and Greene, Richard F., 4,578,614, Cl. 313-309.000.

Greenwald, Harry; and Lier, Pierre, to Kidde, Inc. Switching device for a coin controlled machine. 4,578,548, Cl. 200-38.00F.

Greenwood, Arthur R., to UOP Inc. Gas circulation method for moving bed catalyst regeneration zones. 4,578,370, Cl. 502-37.000.

Greiner, Joachim; and Nippe, Burkhard, to Agfa-Gevaert Aktiengesellschaft. Process for the production of a magnetic recording material with perpendicular orientation. 4,578,280, Cl. 427-47.000.

Grenier, Wilfred J.: *See*—
Baldarelli, Wallace E.; and Grenier, Wilfred J., 4,578,015, Cl. 414-513.000.

Gribshaw, Franklin C.: *See*—
Lang, Paul W.; and Gribshaw, Franklin C., 4,578,709, Cl. 358-230.000.

Grieben, Karl-Heinz, to Hauni-Werke Korber & Co. KG. Apparatus for tip turning filter cigarettes or the like. 4,577,644, Cl. 131-94.000.

Griesbach, Ray H.: *See*—
Hustad, Gerald O.; Griesbach, Ray H.; and Anderson, James, 4,577,757, Cl. 206-461.000.

Griffing, Bruce F.; and West, Paul R., to General Electric Company. Photolithographic method using a two-layer photoresist and photobleachable film. 4,578,344, Cl. 430-312.000.

Griffith, James R.; and O'Rear, Jacques G., to Geo-Centers, Inc. Fluoroacrylate ester, polymer thereof, and process of making the same. 4,578,508, Cl. 560-221.000.

Grigo, Ulrich R.: *See*—
Krishnan, Sivaram; Grigo, Ulrich R.; and Folajtar, Donald A., 4,578,409, Cl. 524-94.000.

Grinde, James E.: *See*—
Foote, Douglas C.; and Grinde, James E., 4,577,712, Cl. 180-53.400.

Grittmann, Ernst-Juergen: *See*—
Boehm, Udo; Grittmann, Ernst-Juergen; and Schulze-Berge, Klaus, 4,578,726, Cl. 360-99.000.

Groenhof, Eugene D., to Dow Corning Corporation. Silicone traction fluids. 4,577,523, Cl. 74-200.000.

Gromelski, Stanley J., Jr.: *See*—
Amabile, Robert N.; Judd, Richard E.; and Gromelski, Stanley J., Jr., 4,578,407, Cl. 524-55.000.

Grosch, James T., to AT&T Bell Laboratories. Buck boost switching regulator with duty cycle limiting. 4,578,630, Cl. 323-271.000.

Gross, Jack R.: *See*—
Granzow, Robert H.; Daulton, Richard H.; Placke, Dale L.; Adelberger, Donald L.; Gross, Jack R.; and Nagy, Charles S., 4,578,009, Cl. 414-43.000.
Placke, Dale L.; Filliman, Mark D.; Granzow, Robert H.; Gross, Jack R.; and Nagy, Charles S., 4,577,763, Cl. 209-534.000.

Grosser, Siegfried; Ludwig, Christian; Wallner, Kurt; Herzog, Karl; and Bayerl, Eugen, to Carl-Zeiss-Stiftung. Lens mount with noise reducing means. 4,577,944, Cl. 352-35.000.

Grossman, Leonard N.: *See*—
Schoenig, Frederick C., Jr.; and Grossman, Leonard N., 4,577,565, Cl. 110-237.000.

Grover, Donald D.; and Kaufman, Glenn A., to Snap-on Tools Corporation. Transducer and holder therefor for ultrasonic acoustic tachometer. 4,577,496, Cl. 73-119.00A.

Gruber, Peter: *See*—
Stricker, Herbert; Freund, Bernhard; Harwalik, Heribert; Rominger, Karl L.; Darda, Siegfried; Haselbarth, Volkmar; Arndts, Dietrich; Bechtel, Wolf D.; Bozler, Gerhard; Brickl, Rolf; and Gruber, Peter, 4,578,264, Cl. 424-37.000.

Gruber, Robert J.; Koch, Ronald J.; and Knapp, John F., to Xerox Corporation. Development process with toner composition containing low molecular weight waxes. 4,578,338, Cl. 430-120.000.

Gruber, Werner, to Henkel Kommanditgesellschaft auf Aktien. Polyamide sheathed optical waveguide fibers. 4,578,284, Cl. 427-163.000.

Gruett, Donald G., to Oil Rite Corporation. Lubricant metering valve. 4,577,728, Cl. 184-7.400.

Grunder, Roland, to Grapha-Holding AG. Apparatus for counting the sheets in a stream of partly overlapping sheets. 4,577,852, Cl. 271-188.000.

Grunst, Heinz; and Kleine, Heinz, to Square D Starkstrom GmbH. Snap action electrical switch. 4,578,549, Cl. 200-76.000.

GTE Products Corporation: *See*—
Ritsko, Joseph E.; and Acla, Howard L., 4,578,251, Cl. 423-55.000.

Guery S.A.: *See*—
Petit, Raymond, 4,578,012, Cl. 414-310.000.

Guillemin, Jean, to VALEO. Flap for a heater or air conditioner installation for a motor vehicle cabin. 4,577,836, Cl. 251-356.000.

Guillen, Richard H. Anti-glare device for side mounted rear vision mirrors. 4,577,929, Cl. 350-283.000.

Gulf Research & Development Company: *See*—
Onopchenko, Anatoli; and Sabourin, Edward T., 4,578,497, Cl. 556-479.000.

Gulf & Western Manufacturing Company: *See*—
Foster, Gordon T., 4,577,816, Cl. 244-148.000.
Hernandez, Santiago, 4,577,817, Cl. 244-148.000.

Gulliver, Michael D.: *See*—
White, James M.; May, Ronald W.; and Gulliver, Michael D., 4,578,711, Cl. 358-282.000.

Gunther, Horst H.; and Oesterle, Hermann F., to International Standard Electric Corporation. Electric switch. 4,578,547, Cl. 200-11.0DA.

Gupta, Desh B.: *See*—
Granzow, Robert H.; Gupta, Desh B.; and Myers, Kimbrough I., 4,578,567, Cl. 235-380.000.

Gupta, Mool C.; and Stinson, Douglas G., to Eastman Kodak Company. Optical recording and information elements. 4,578,684, Cl. 346-135.100.

Gursky, Herbert: *See*—
Meekins, John F.; and Gursky, Herbert, 4,578,804, Cl. 378-84.000.

Gyles, Colin: *See*—
Crooke, Arthur W.; Gyles, Colin; and Stebbins, Edwin E., 4,578,640, Cl. 324-115.000.

Gyugyi, Laszlo; Heinrich, Theodore M.; and Cho, Gyu-Hyeong, to Westinghouse Electric Corp. Interlaced pulse-width modulated unrestricted frequency changer system. 4,578,746, Cl. 363-161.000.

H.F. & Ph.F Reemtsma GmbH & Co.: *See*—
Ziehn, Klaus-Dieter, 4,577,646, Cl. 131-296.000.

H. Pattison & Company Ltd.: *See*—
Hemingway, James K., 4,577,899, Cl. 294-95.000.

Ha, Eric P. L.: *See*—
Faggin, Federico; Klein, Jerry A.; Yazolino, Lauren F.; Korody, Robert; Ha, Eric P. L.; and Kerman, Stephan, 4,578,537, Cl. 179-2.0DP.

Habib, Wagdi W., to Hollister Incorporated. Protective sealing composition in molded form. 4,578,065, Cl. 604-336.000.

Hacker, Heinz: *See*—
Kleeberg, Wolfgang; Hauschildt, Klaus-Robert; Hacker, Heinz; and Kretzschmar, Klaus, 4,578,452, Cl. 528-297.000.

Hafner, Hans W., to Pfister GmbH. Gyroscope load cell. 4,577,519, Cl. 74-5.00F.

Haga, Kyosuke; and Tanaka, Tsuneo, to Toyoda Koki Kabushiki Kaisha. Rotary servovalve. 4,577,660, Cl. 137-625.240.

Hagemeister, Klaus, to MTU Motoren- und Turbinen-Union Munchen GmbH. Profiled-tube heat exchanger. 4,577,684, Cl. 165-172.000.

Hagemeister, Robert C., to Webster Spring Co. Inc. Bent wire spring unit. 4,577,841, Cl. 267-103.000.

Hagino, Shigeo. Reciprocating internal-combustion engine of low-temperature catalytic-combustion type. 4,577,611, Cl. 123-669.000.

Hahn, A. David, to Jarvis Products Corporation. Dehorner. 4,577,407, Cl. 30-180.000.

Hahn, Frederick C., to ESCO Corporation. Excavating tooth system. 4,577,423, Cl. 37-142.00R.

Hahn, Hyo K.: *See*—
Healey, Daniel J., III; and Hahn, Hyo K., 4,578,634, Cl. 324-56.000.

Haken, Roger A., to Texas Instruments Incorporated. Fabrication of polysilicon to polysilicon capacitors with a composite dielectric layer. 4,577,390, Cl. 29-570.000.

Halas, William P.: *See*—
Borg, Kevin E.; Halas, William P.; Mattes, Hans G.; McLear, Paul M.; and White, Lester L., 4,578,540, Cl. 179-2.00A.

Halbritter, Gunter: *See*—
Kiss, Akos; Kleinschmit, Peter; Volker, Werner; and Halbritter, Gunter, 4,578,212, Cl. 252-301.40F.

Hall, Bradley G. Athletic padded garment. 4,577,346, Cl. 2-2.000.

Hall, Charles B., to Outboard Marine Corporation. Marine hydraulic steering system control. 4,578,039, Cl. 440-61.000.

Hall, Charles P.; and Philipson, Joseph, to Monterey Manufacturing Co. Self-sealing waterbed mattress. 4,577,357, Cl. 5-451.000.

Hall, Charles P.: *See*—
Johenning, John B.; and Hall, Charles P., 4,577,356, Cl. 5-450.000.

Hall, Herbert G.: *See*—
McCrory, Carl E.; and Hall, Herbert G., 4,577,975, Cl. 366-314.000.

Hall, Wilbur S., to Amchem Products, Inc. Iodine compound activation of autodeposition baths. 4,578,419, Cl. 524-401.000.

Halliburton Company: *See*—
Ritter, Thomas E., 4,577,410, Cl. 33-129.000.
Smith, Harry D., Jr., 4,578,580, Cl. 250-269.000.

Halliwell, Michael J.; and Zahavi, Joseph. Laser induced deposition on polymeric substrates. 4,578,155, Cl. 204-15.000.

Halliwell, Michael J.; and Zahavi, Joseph. Laser induced deposition of GaAs. 4,578,157, Cl. 204-15.000.

Hamada, Hideo: *See*—
Niikura, Yasuhiro; Morimoto, Yoshiro; Hamada, Hideo; Suga, Masaaki; and Murasugi, Takashi, 4,577,737, Cl. 192-0.032.

Hamaguchi, Hiroyuki, to NEC Corporation. Multilayer wiring substrate. 4,578,304, Cl. 428-209.000.

Hamane, Masumi; and Kimoto, Masahiko, to Honda Giken Kogyo Kabushiki Kaisha. Motorcycle engine cooling system. 4,577,720, Cl. 180-229.000.

Hamashima, Yoshio; Ishikura, Koji; Kubota, Tadatoshi; and Minami, Kyoji, to Shionogi & Co., Ltd. (Oxoheterocyclic carbonamido)-cephem carboxylic acid derivatives. 4,578,378, Cl. 514-210.000.

Hamisch, Paul H., Jr.; Vanderpool, James L.; and Bain, James M., to Monarch Marking Systems, Inc. Hand-held labeler having adjustable web positioning system. 4,578,138, Cl. 156-361.000.

Hamlin, Robert N.: *See*—
Arkell, James J.; and Hamlin, Robert N., 4,578,078, Cl. 623-6.000.

Hammar, W. James, to Minnesota Mining and Manufacturing Company. Acrylate and methacrylate monomers and polymers. 4,578,504, Cl. 560-112.000.

Hams, Kenneth A., to Bell & Howell Company. Method and apparatus for controlling the actuation of gripper arms. 4,577,848, Cl. 270-55.000.

Hanada, Koji; Kinoshita, Yuji; and Tamura, Masaru, to Fujitsu Limited. Housing for an electromagnetic relay. 4,578,660, Cl. 335-133.000.

Handl, Werner, to Staedtler, J. S. Eraser with thermoplastic binder. 4,578,420, Cl. 524-490.000.

Handy Button Machine Company: *See*—
Bush, E. Dan, 4,577,373, Cl. 24-90.00B.

Hani, Kiyoshi; Takei, Takako; Kodama, Minekazu; and Sugano, Toshiyuki, to Mitsubishi Denki Kabushiki Kaisha. Laminated board lined with thermally and electrically conductive material. 4,578,308, Cl. 428-297.000.

Hankwitz, Edward H.: *See*—
Klabunde, Steven E.; Hankwitz, Edward H.; and Maastricht, Charles, 4,577,535, Cl. 82-2.00E.

Hanlon, James H.: *See*—
Franz, Helmut; Hanlon, James H.; and Shick, Lloyd G., 4,578,203, Cl. 252-49.300.

Hansen, Hans-Jurgen; Schmid, Rudolf; and Schmid, Max, to Hoffmann-La Roche Inc. Process for the manufacture of optically active compounds. 4,578,462, Cl. 544-177.000.

Hansen, William P., Jr., to Ortho Diagnostics, Inc. Apparatus and method for detecting platelets in whole blood. 4,577,964, Cl. 356-39.000.

Hanyu, Susumu; and Kato, Kenji, to Janome Sewing Machine Co., Ltd. Stitching adjustment device of a sewing machine. 4,577,576, Cl. 112-456.000.

Hanzawa, Tuneo, to K. K. Hanzawa Corporation. Driving/turnaround device for a remote controlled toy vehicle. 4,577,528, Cl. 74-665.0GA.

Hara, Yoichi; and Seimiya, Yasuo, to Nissan Motor Company, Limited. Control system for fuel pump for internal combustion engine. 4,577,604, Cl. 123-397.000.

Harada, Hiroshi: *See*—
Sumino, Yoshitsugu; and Harada, Hiroshi, 4,578,040, Cl. 440-73.000.

Harada, Shinichi; Ishihara, Yoshinobu; and Matsushita, Shigeru, to Kabushiki Kaisha Kobe Seiko Sho. Guide roll. 4,577,673, Cl. 164-448.000.

Harada, Shinichi; Toyoda, Hiroshi; Honma, Katsuhiko; and Matsushita, Shigeru, to Kabushiki Kaisha Kobe Seiko Sho. Guide roll. 4,577,674, Cl. 164-448.000.

Harada, Shinichi: *See*—
Ishihara, Yoshinobu; and Harada, Shinichi, 4,577,675, Cl. 164-448.000.

Harder, Hans E.; Behrens, Klaus; and Kotz, Rainer, to Howmedica International, Inc. Bone prosthesis. 4,578,081, Cl. 623-22.000.

Harder, Klaus-Burkhard: *See*—
Richter, Ekkehard; Korbacher, Werner; Knoblauch, Karl; Giessler, Klaus; and Harder, Klaus-Burkhard, 4,578,089, Cl. 55-26.000.

Harding, George W., to Poly-John Enterprises Corp. Portable toilet cabana. 4,577,351, Cl. 4-460.000.

Harenberg, Holger, to Autoflug GmbH. Buckle for safety belts. 4,577,378, Cl. 24-635.000.

Harigane, Kotaro; Ihara, Keiichi; Ito, Tetsuro; and Shudo, Hirokazu, to TDK Corporation. Electronic component selection and supply apparatus in automatic electronic component inserting machine. 4,578,010, Cl. 414-126.000.

Hariu, Hajime: *See*—
Ikeda, Itsuo; Kurokawa, Junji; Hasebe, Mitsuo; Miyagawa, Seiichi; and Hariu, Hajime, 4,578,331, Cl. 430-42.000.

Harrington, John H.; and Rangaswamy, Subramaniam, to Metco Inc. Aluminum and cobalt coated thermal spray powder. 4,578,115, Cl. 75-255.000.

Harrington, John H.: *See*—
Rangaswamy, Subramaniam; and Harrington, John H., 4,578,114, Cl. 75-252.000.

Harris Graphics Corporation: *See*—
Duke, B. Michael, 4,577,853, Cl. 271-217.000.

Harris, James E.: *See*—
Bartlett, Brian E.; Harris, James E.; and Wilkes, John G., 4,578,145, Cl. 156-616.00R.

Harris, Joe L. Trailer hitch. 4,577,884, Cl. 280-507.000.

Harris, Walter L. Ski attachment for vehicle wheels. 4,577,876, Cl. 280-13.000.

Harrison, Earnest R., Jr., to Westinghouse Electric Corp. Delay lattice filter for radar doppler processing. 4,578,676, Cl. 343-17.10R.

Harrison, James S. Composition for diagnostic reagents. 4,578,282, Cl. 422-57.000.

Hartenstein, Johannes: *See*—
Satzinger, Gerhard; Barth, Hubert; Hartenstein, Johannes; Herrmann, Manfred; Fritschi, Edgar; and Schutt, Ilse-Dore, 4,578,380, Cl. 514-232.000.

Hartle, Clair W., Jr.: *See*—
Bake, Earl A.; and Hartle, Clair W., Jr., 4,577,872, Cl. 277-12.000.

Hartmann & Braun AG: *See*—
Zochbauer, Michael, 4,578,618, Cl. 313-563.000.

Hartmann, Ludwig. Process for the production of spunbonded fabrics from aerodynamically drawn filaments. 4,578,134, Cl. 156-167.000.

Harvey, Paul-Etienne: *See*—
Armand, Michel; Muller, Daniel; Duval, Michel; and Harvey, Paul-Etienne, 4,578,326, Cl. 429-192.000.

Harwalik, Heribert: *See*—
Stricker, Herbert; Freund, Bernhard; Harwalik, Heribert; Rominger, Karl L.; Darda, Siegfried; Haselbarth, Volkmar; Arndts, Dietrich; Bechtel, Wolf D.; Bozler, Gerhard; Brickl, Rolf; and Gruber, Peter, 4,578,264, Cl. 424-37.000.

Harwood, Alan R.; and Ward, Julie A., to EMI Limited. Strain sensing arrangement. 4,577,513, Cl. 73-862.040.

Hasebe, Mitsuo: *See*—
Ikeda, Itsuo; Kurokawa, Junji; Hasebe, Mitsuo; Miyagawa, Seiichi; and Hariu, Hajime, 4,578,331, Cl. 430-42.000.

Hasegawa, Shinichi, to Pioneer Electronic Corporation. Lens system for projection television. 4,578,710, Cl. 358-231.000.

Haselbarth, Volkmar: *See*—
Stricker, Herbert; Freund, Bernhard; Harwalik, Heribert; Rominger, Karl L.; Darda, Siegfried; Haselbarth, Volkmar; Arndts, Dietrich; Bechtel, Wolf D.; Bozler, Gerhard; Brickl, Rolf; and Gruber, Peter, 4,578,264, Cl. 424-37.000.

Hashimoto, Minoru: *See*—
Ito, Takeo; Ido, Tadashi; Takeuchi, Hajime; Hashimoto, Minoru; Maeda, Tatsumi; and Awa, Masashi, 4,578,313, Cl. 428-403.000.

Hasselbach, Petra: *See*—
Holdt, Bernd-Dieter; Menke, Ronald; Praus, Gerd; and Hasselbach, Petra, 4,578,207, Cl. 252-134.000.

Hasumi, Shunji: *See*—
Kawata, Hiroitsu; Ohmura, Tadayoshi; Hasumi, Shunji; Konno, Yutaka; Aruga, Masayoshi; Tashiro, Seiki; Konno, Toshimitsu; and Iwai, Ken, 4,578,391, Cl. 514-256.000.

Hata, Shun-ichi: *See*—
Nagano, Hiroyuki; Takagi, Mitiro; Kubodera, Noboru; Matsunaga, Isao; Nabata, Hiroyuki; Ohba, Yasuhiro; Sakai, Kazushige; Hata, Shun-ichi; and Uchida, Yasumi, 4,578,465, Cl. 544-285.000.

Hatfield, Raymond W., to Landey, Michael. Method of producing adherent metallic film. 4,578,310, Cl. 428-334.000.

Hathaway, Roderick D.: *See*—
Demmer, Christopher G.; and Hathaway, Roderick D., 4,578,438, Cl. 525-481.000.

Hatsuse, Toshikazu: *See*—
Kimura, Sosaku; and Hatsuse, Toshikazu, 4,577,845, Cl. 269-73.000.

Hauni-Werke Korber & Co. KG: *See*—
Grieben, Karl-Heinz, 4,577,644, Cl. 131-94.000.

Haupt, Randy L., to United States of America, Air Force. Feed displacement correction in a space fed lens antenna. 4,578,680, Cl. 343-703.000.

Hauschildt, Klaus-Robert: *See*—
Kleeberg, Wolfgang; Hauschildt, Klaus-Robert; Hacker, Heinz; and Kretzschmar, Klaus, 4,578,452, Cl. 528-297.000.

Havemann, Ingeborg: *See*—
Cyriacy, Frieda; Albers, Horst; and Havemann, Ingeborg, 4,577,703, Cl. 175-79.000.

Hawkeye Chemical Company: *See*—
Moore, William P., 4,578,105, Cl. 71-28.000.

Hawkeye Concrete Products Co.: *See*—
Schmidgall, Jon A.; and Schmidgall, Hartzell H., 4,578,235, Cl. 264-71.000.

Hawkins, Floyd A., Jr. Method of making a three dimensional sculptured painting. 4,578,131, Cl. 156-62.000.

Hawkins, Jeffrey T.: *See*—
Gassmann, Zean Z.; Hawkins, Jeffrey T.; and Brown, Alfred, 4,577,688, Cl. 166-245.000.

Hay, James V.; and Sauers, Richard F., to Du Pont de Nemours, E. I., and Company. Herbicidal benzenesulfonamides. 4,578,108, Cl. 71-93.000.

Hayashi, Masanori; Sakurai, Akira; and Aso, Shigeru, to Kyushu University. Multi-layered thin film heat transfer gauge. 4,577,976, Cl. 374-29.000.

Hayashi, Yoshimasa; Kubozuka, Takao; and Hirano, Yoshinori, to Nissan Motor Co., Ltd. Cooling system for automotive engine. 4,577,594, Cl. 123-41.080.

Hayes, Lloyd P.: *See*—
James, Bertram G.; Dinapoli, Frank C.; and Hayes, Lloyd P., 4,578,620, Cl. 315-3.500.

Hazenbroek, Jacobus E. Apparatus for cutting apart poultry wings. 4,577,368, Cl. 17-11.000.

Head, Donald L.: *See*—
Saccocio, Edward J.; Kiser, T. Kay; Wright, Richard F.; and Head, Donald L., 4,578,340, Cl. 430-138.000.

Healey, Daniel J., III; and Hahn, Hyo K., to Westinghouse Electric Corp. Apparatus for determining frequency versus acceleration characteristics for crystals. 4,578,634, Cl. 324-56.000.

Heat Exchanger Industries, Inc.: *See*—
Warner, Donald F., 4,577,380, Cl. 29-157.30C.

Heckl, Franz: *See*—
Geyken, Erwin; Heckl, Franz; Kastl, Alfons; Lehnert, Klaus; and Loistl, Rudolf, 4,577,949, Cl. 354-319.000.

Hedden, Roger L. Anchor with pivoting arms. 4,577,582, Cl. 114-298.000.

Hefner, Robert E., Jr., to Dow Chemical Company, The. Styryl pyridine cyanates, styryl pyrazine cyanates and polymers thereof. 4,578,439, Cl. 525-509.000.

Hehl, Karl. Safety cover arrangement for injection molding machine with die exchange mechanism. 4,578,026, Cl. 425-151.000.

HEI, Inc.: *See*—
Arp, Bradley W.; Lindberg, Ronald O. J.; and Mueller, Wayne A., 4,578,569, Cl. 235-454.000.

Heil-Quaker Corporation: *See*—
Tomlinson, Ronald S., 4,577,615, Cl. 126-99.00A.

Heiman, Gary L., to Standard Textile Company, Inc. Woven sheeting material and method of making same. 4,578,306, Cl. 428-225.000.

Heinrich, Theodore M.: *See—*
Gyugyi, Laszlo; Heinrich, Theodore M.; and Cho, Gyu-Hyeong, 4,578,746, Cl. 363-161.000.
Heitkamp, John J., Jr.: *See—*
Heitkamp, Lawrence F., III; and Heitkamp, John J., Jr., 4,578,041, Cl. 441-30.000.
Heitkamp, Lawrence F., III; and Heitkamp, John J., Jr., to Trip-Saver Inc. Water actuated inflatable float device. 4,578,041, Cl. 441-30.000.
Heitmann, Heinrich; Tolksdorf, Wolfgang; Welz, Fritz; and Witter, Klaus, to U.S. Philips Corporation. Magnetooptical modulator. 4,578,651, Cl. 332-7.510.
Heitmann, Jurgen; Loos, Rolf; and Wagner, Peter, to Robert Bosch GmbH. Tracking error recognition in reproduced digital signals. 4,578,719, Cl. 360-31.000.
Helal, Basil H. Joint prostheses. 4,578,080, Cl. 623-13.000.
Helix Technology Corporation: *See—*
Olsen, Donald A.; and Eacobacci, Michael J., 4,577,465, Cl. 62-55.500.
Heller, Donald F.: *See—*
Krasinski, Jerzy S.; Heller, Donald F.; and Kafri, Oded, 4,577,940, Cl. 350-502.000.
Hellman, Erik: *See—*
Borrman, Bo; Hellman, Erik; Lundin, Nils; and Ode, Bengt, 4,578,241, Cl. 376-446.000.
Hellring, Stuart D.: *See—*
Chang, Clarence D.; and Hellring, Stuart D., 4,578,521, Cl. 568-771.000.
Hemingway, James K., to H. Pattison & Company Ltd. Liner cup remover. 4,577,899, Cl. 294-95.000.
Henkel Kommanditgesellschaft auf Aktien: *See—*
Geke, Juergen; and Stedry, Bernd, 4,578,208, Cl. 252-135.000.
Gruber, Werner, 4,578,284, Cl. 427-163.000.
Holdt, Bernd-Dieter; Menke, Ronald; Praus, Gerd; and Hasselbach, Petra, 4,578,207, Cl. 252-134.000.
Hennessy, Michael P.; and Prueher, Andrew B. Protective canister for computer discs. 4,577,756, Cl. 206-444.000.
Hernandez, Santiago, to Gulf & Western Manufacturing Company. Three-dimensional vacuum envelope. 4,577,817, Cl. 244-148.000.
Herrera, Samuel R. Portable cooler. 4,577,475, Cl. 62-457.000.
Herrin, Robert M. Carton erection and sealing apparatus. 4,578,054, Cl. 493-126.000.
Herrle, Wolfgang: *See—*
Klosterhuber, Rolf; and Herrle, Wolfgang, 4,577,956, Cl. 355-40.000.
Herrmann, Manfred: *See—*
Satzinger, Gerhard; Barth, Hubert; Hartenstein, Johannes; Herrmann, Manfred; Fritschi, Edgar; and Schutt, Ilse-Dore, 4,578,380, Cl. 514-232.000.
Hersey, Fredrick B. Invertible and reversible holster. 4,577,787, Cl. 224-243.000.
Hertl, William; and Schaeffler, Robert G., to Corning Glass Works. Fuel cell using quinones to oxidize hydroxylic compounds. 4,578,323, Cl. 429-15.000.
Herzog, Karl: *See—*
Grosser, Siegfried; Ludwig, Christian; Wallner, Kurt; Herzog, Karl; and Bayerl, Eugen, 4,577,944, Cl. 352-35.000.
Heuge Export AG: *See—*
Van Uden, Adrianus A.; and Claessen, Johannes A. H., 4,578,132, Cl. 156-72.000.
Hewlett Packard Company: *See—*
Cloutier, Frank L.; McClelland, Paul H.; Boucher, William R.; and Siewell, Gary L., 4,578,687, Cl. 346-140.00R.
Hibshman, Henry J. Storage systems for heat or cold including aquifers. 4,577,679, Cl. 165-45.000.
Hice, John R., to Data Information Management Systems, Inc. Modular microprocessor-based system for printing and reading a personal identifier code on a form. 4,578,572, Cl. 235-472.000.
Hickey, John L., to Dana Corporation. Differential cross shaft retaining means. 4,577,530, Cl. 74-713.000.
Hickmann, Horst R. Oxygen dome for small animals. 4,577,628, Cl. 128-205.260.
Hickory Industries, Inc.: *See—*
Maroti, Steven; and Formosa, Daniel, 4,577,550, Cl. 99-329.0RT.
Hieda, Kazuo: *See—*
Saito, Teruo; Asai, Kuniaki; and Hieda, Kazuo, 4,578,427, Cl. 525-150.000.
Higami, Masanobu. Fingertip exerciser. 4,577,858, Cl. 272-67.000.
Higgs, Jacob K.; and Humenick, John, to Sprague Electric Company. Integrated circuit with stress isolated Hall element. 4,578,692, Cl. 357-27.000.
Highton, Frederick J., to General Electric Company. Received signal strength indicator. 4,578,820, Cl. 455-154.000.
Higo, Tomio: *See—*
Sato, Yoshiyuki; Isozaki, Akio; Higo, Tomio; and Uchida, Tetsuo, 4,577,381, Cl. 29-157.400.
Hijikata, Isamu; Uehara, Akira; and Nakane, Hisashi, to Tokyo Ohka Kogyo Co., Ltd. Plasma etching method. 4,578,559, Cl. 219-121.0PE.
Hill, Dale A.: *See—*
Wright, Paul R.; and Hill, Dale A., 4,577,454, Cl. 53-492.000.
Hill, Theodore B.: *See—*
Scott, Daniel G.; and Hill, Theodore B., 4,577,870, Cl. 277-1.000.
Hills, Robert G. C., to Eastman Kodak Company. Device for stabilizing the movement of a floppy disk over a magnetic head. 4,578,727, Cl. 360-102.000.
Hilti Aktiengesellschaft: *See—*
Jochum, Peter, 4,577,793, Cl. 227-10.000.
Hine, Edward K., Jr.: *See—*
Dowrick, David C.; Hine, Edward K., Jr.; and Hine, Gregory S., 4,577,786, Cl. 224-32.00A.
Hine, Gregory S.: *See—*
Dowrick, David C.; Hine, Edward K., Jr.; and Hine, Gregory S., 4,577,786, Cl. 224-32.00A.
Hine-Snowbridge, Inc.: *See—*
Dowrick, David C.; Hine, Edward K., Jr.; and Hine, Gregory S., 4,577,786, Cl. 224-32.00A.
Hirai, Seiichi; Nishizawa, Akira; and Otsuka, Nobuyuki, to Honda Giken Kogyo Kabushiki Kaisha. Slidable type constant velocity universal joint. 4,578,048, Cl. 464-111.000.
Hiramoto, Tatsumi, to Ushio Denki Kabushiki Kaisha. Method for forming a single crystal silicon layer. 4,578,144, Cl. 156-617.00R.
Hirano, Yoshinori: *See—*
Hayashi, Yoshimasa; Kubozuka, Takao; and Hirano, Yoshinori, 4,577,594, Cl. 123-41.080.
Hirao, Kazuhiro: *See—*
Asano, Hiroshi; Shimamune, Takayuki; and Hirao, Kazuhiro, 4,578,160, Cl. 204-98.000.
Hiraoka Kogyo Kabushiki Kaisha: *See—*
Okugawa, Yoshio, 4,577,569, Cl. 112-83.000.
Hirasawa, Kunio: *See—*
Tokuyama, Shunji; Suzuki, Kooji; Hirasawa, Kunio; Yoshioka, Yoshio; and Arimatsu, Keiji, 4,578,730, Cl. 361-4.000.
Hirata, Tadashi; and Amano, Tadashi, to Amada Company Limited. Backgauge device. 4,577,538, Cl. 83-467.00R.
Hirata, Yasuo: *See—*
Yasuda, Yutaka; Hirata, Yasuo; Murakami, Shuji; Nakamura, Katsuhiro; and Furuya, Yukitsuna, 4,578,800, Cl. 375-106.000.
Hirate, Shintaro: *See—*
Yamada, Tetsusyo; and Hirate, Shintaro, 4,578,171, Cl. 204-406.000.
Yamada, Tetsusyo; and Hirate, Shintaro, 4,578,172, Cl. 204-412.000.
Hirose Manufacturing Company Limited: *See—*
Hirose, Tokuzo, 4,577,572, Cl. 112-231.000.
Hirose, Tokuzo, to Hirose Manufacturing Company Limited. Fully rotating hook for a lock stitch sewing machine. 4,577,572, Cl. 112-231.000.
Hisaka Works, Ltd.: *See—*
Ishimaru, Osamu, 4,578,085, Cl. 8-152.000.
Hisamoto, Iwao; and Omure, Yukio, to Daikin Kogyo Co., Ltd. Composition for cleaning surface of substrate. 4,578,209, Cl. 252-143.000.
Hitachi Engineering Co., Ltd.: *See—*
Kitamura, Masao; Nakayama, Norio; Katsura, Ryoei; Ibe, Hidefumi; and Uchida, Shunsuke, 4,578,154, Cl. 204-1.00T.
Hitachi, Ltd.: *See—*
Gotou, Tadashi; Kawamura, Fumio; Sagawa, Norihiko; and Yusa, Hideo, 4,578,325, Cl. 429-91.000.
Kanda, Hiroshi; and Ishikawa, Isao, 4,577,504, Cl. 73-606.000.
Kitamura, Masao; Nakayama, Norio; Katsura, Ryoei; Ibe, Hidefumi; and Uchida, Shunsuke, 4,578,154, Cl. 204-1.00T.
Mori, Toshikatsu; Takeuchi, Seizi; Matsuda, Shimpei; Kumagi, Teruo; Kato, Akira; Yamashita, Hisao; and Takeuchi, Masato, 4,578,112, Cl. 75-108.000.
Ozawa, Naoki; Akiyama, Toshiyuki; Nagahara, Shuusaku; Ohba, Shinya; Ando, Haruhisa; and Ozaki, Toshifumi, 4,578,707, Cl. 358-212.000.
Sakamoto, Masami; Nagumo, Ryoichi; and Ishihara, Tamio, 4,577,409, Cl. 33-18.100.
Shimizu, Keizo; Otsu, Shimpei; Fujimura, Toshio; Taniguchi, Yoshisada; and Nagami, Hayashi, 4,578,787, Cl. 369-77.200.
Suzuki, Ryo; Sugita, Yutaka; Takeuchi, Teruaki; Kodama, Naoki; Takeshita, Masatoshi; and Umezaki, Hiroshi, 4,578,775, Cl. 365-36.000.
Tokuyama, Shunji; Suzuki, Kooji; Hirasawa, Kunio; Yoshioka, Yoshio; and Arimatsu, Keiji, 4,578,730, Cl. 361-4.000.
Yamamoto, Naoki; and Sakudo, Noriyuki, 4,577,396, Cl. 29-576.00B.
Yazawa, Yoshiaki; Miyakawa, Nobuaki; Mukai, Toji; Ikeda, Takahide; and Kamei, Tatsuya, 4,578,693, Cl. 357-30.000.
Hitachi, Ltd: *See—*
Maio, Kenji; and Moritani, Atsushi, 4,578,646, Cl. 328-128.000.
Hitachi Medical Corporation: *See—*
Maio, Kenji; and Moritani, Atsushi, 4,578,646, Cl. 328-128.000.
Hitachi Zosen Corporation: *See—*
Tomita, Yukio; Nabeshima, Kenjiro; and Shibamoto, Nobuji, 4,577,564, Cl. 110-110.000.
Hoag, Ethan D., to Metalworking Lasers International Ltd. High-power lasers. 4,578,792, Cl. 372-58.000.
Hochmair, Erwin S.: *See—*
Hochmair, Ingeborg J.; and Hochmair, Erwin S., 4,577,641, Cl. 128-746.000.
Hochmair, Ingeborg J.; and Hochmair, Erwin S. Method of fitting hearing prosthesis to a patient having impaired hearing. 4,577,641, Cl. 128-746.000.
Hoechst Aktiengesellschaft: *See—*
Deger, Hans-Matthias; Erckel, Rudiger; and Fruhbeis, Horst, 4,578,469, Cl. 546-66.000.
Muller, Thomas; and Siegemund, Gunter, 4,578,369, Cl. 502-36.000.
Rieck, Hans-Peter, 4,578,258, Cl. 423-325.000.
Rieck, Hans-Peter; and Kalz, Hans-Jurgen, 4,578,371, Cl. 502-71.000.
Schorlemmer, Hans-Ulrich; Dickneite, Gerhard; Sedlacek, Hans-Harald; de Souza, Noel J.; and Dohadwalla, Alihussein N., 4,578,399, Cl. 514-455.000.

Hoechst-Roussel Pharmaceuticals Incorporated: *See*—
Allen, Richard C.; Effland, Richard C.; and Klein, Joseph T., 4,578,394, Cl. 514-332.000.

Hoehn, Gustave L., Jr., to Mobil Oil Corporation. Borehole logging tool utilizing electromagnetic energy in the determination of dip of subsurface formations surrounding a borehole. 4,578,645, Cl. 324-338.000.

Hofeler, Henry H., to Procter & Gamble Company, The. Method of and apparatus for forming and cartoning multi-stack arrays of compressible articles. 4,577,453, Cl. 53-438.000.

Hoff, Raymond E.: *See*—
Pullukat, Thomas J.; and Hoff, Raymond E., 4,578,440, Cl. 526-128.000.

Hoffman-La Roche Inc.: *See*—
Furst, Andor; Muller, Marcel; Kerb, Ulrich; and Wiechert, Rudolf, 4,578,475, Cl. 548-126.000.

Hoffmann-La Roche Inc.: *See*—
Hansen, Hans-Jurgen; Schmid, Rudolf; and Schmid, Max, 4,578,462, Cl. 544-177.000.

Hoffmann, Wilfried, to Auergesellschaft GmbH. Gas-tight protective garment with hood. 4,577,348, Cl. 2-84.000.

Hofmann, Gunter A., to Biotronics. Apparatus for fusing live cells with electric fields. 4,578,168, Cl. 204-299.00R.

Hofmann, Horst; and Reckert, Jurgen, to Systemform Datenbelege GmbH. Device for severing sets of endless forms or the like. 4,577,789, Cl. 225-100.000.

Hofmann, Peter, to Chemische Werke Huls Aktiengesellschaft. Methods for reprocessing cobalt catalysts used in hydrocarboxylation. 4,578,367, Cl. 502-24.000.

Hofmeister, John F. Method and apparatus for direct in vivo monitoring of uterine electrical activity. 4,577,640, Cl. 128-738.000.

Hogan, Robert J.: *See*—
Kukes, Simon G.; Johnson, Marvin M.; Strope, Daniel J.; and Hogan, Robert J., 4,578,179, Cl. 208-110.000.
Kukes, Simon G.; Hogan, Robert J.; Coombs, Daniel M.; and Strope, Daniel J., 4,578,180, Cl. 208-110.000.

Hohmann, Claus: *See*—
Kundinger, Josef; Hohmann, Claus; and Muhleck, Martin, 4,578,303, Cl. 428-116.000.

Holba, Albert G.; Doe, Susanne B.; and Hughes, William B., to Phillips Petroleum Company. Analytical method and apparatus. 4,577,492, Cl. 73-61.10C.

Holdorf, Thomas C.: *See*—
Divjak, August A., Jr.; and Holdorf, Thomas C., 4,578,798, Cl. 375-45.000.

Holdt, Bernd-Dieter; Menke, Ronald; Praus, Gerd; and Hasselbach, Petra, to Henkel Kommanditgesellschaft auf Aktien. Two component cleaner and disinfectant tablet. 4,578,207, Cl. 252-134.000.

Holland, Charlie R.; and DelPercio, Michael J., to Coin Acceptors, Inc. Article-dispensing assembly for a vending machine. 4,577,780, Cl. 221-125.000.

Hollinger, Jeffrey O., to United States of America, Army. Polylactic-polyglycolic acids combined with an acidic phospholipid-lysozyme complex for healing osseous tissue. 4,578,384, Cl. 514-8.000.

Hollister, Allen L., to Tektronix, Inc. Digital acquisition system including a high-speed sampling gate. 4,578,667, Cl. 340-347.0SH.

Hollister Incorporated: *See*—
Habib, Wagdi W., 4,578,065, Cl. 604-336.000.

Holsappel, Albert, to Wavin B.V. Method of marking an article having at least a polyolefin surface and an article having a polyolefin surface provided with a black mark of decomposed polyolefin. 4,578,329, Cl. 430-18.000.

Holtman, Dennis C., to Personal Products Company. Absorbent structure containing corrugated web layers. 4,578,070, Cl. 604-378.000.

Holycross, Frank R., Jr., to Masco Corporation of Indiana. Insert for a faucet valve for increasing flow rate. 4,577,835, Cl. 251-310.000.

Homestake Mining Company: *See*—
Kunter, Richard S.; and Turney, John R., 4,578,163, Cl. 204-110.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Amano, Akira; and Sasaki, Kazuhiko, 4,577,455, Cl. 56-17.100.
Ashikawa, Noboru, 4,577,721, Cl. 180-248.000.
Ebisawa, Hiroo; Maruyama, Iwao; Fukuda, Masao; and Miyamoto, Shigeo, 4,578,281, Cl. 427-53.100.
Fuse, Genzo; Abe, Kaoru; and Matsumoto, Isao, 4,578,005, Cl. 409-140.000.
Hamane, Masumi; and Kimoto, Masahiko, 4,577,720, Cl. 180-229.000.
Hirai, Seiichi; Nishizawa, Akira; and Otsuka, Nobuyuki, 4,578,048, Cl. 464-111.000.
Komon, Koichi; Ito, Siro; and Seino, Shuichi, 4,578,290, Cl. 427-421.000.
Nashimoto, Ryo; and Motodate, Shoji, 4,577,917, Cl. 339-150.00T.
Senga, Akihisa, 4,577,596, Cl. 123-52.0MV.
Tomita, Takao, 4,577,597, Cl. 123-73.00A.

Honeywell Inc.: *See*—
Pejsa, Jane H., 4,577,977, Cl. 374-39.000.

Honeywell Information Systems Inc.: *See*—
Morgan, Thomas A., 4,577,400, Cl. 29-739.000.

Honma, Katsuhiko: *See*—
Harada, Shinichi; Toyoda, Hiroshi; Honma, Katsuhiko; and Matsushita, Shigeru, 4,577,674, Cl. 164-448.000.

Hooper, Robert L.; and Yonge, Lawrence W., III, to Raydx Satellite Systems, Ltd. Antenna dish. 4,578,682, Cl. 343-916.000.

Horbelt, Michael: *See*—
Arnold, Herbert; Horbelt, Michael; Seibel, Berthold; Strobele, Hans-Peter; and Werner, Peter, 4,577,605, Cl. 123-479.000.

Horii, Takashi: *See*—
Ogawa, Junji; Nakano, Tomio; Nakano, Masao; Tsuge, Norihisa; and Horii, Takashi, 4,578,781, Cl. 365-203.000.

Horii, Tetsuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Sheet distributing apparatus. 4,578,759, Cl. 364-478.000.

Horikawa, Rikizo: *See*—
Someya, Noboru; and Horikawa, Rikizo, 4,577,515, Cl. 73-863.730.

Hornak, Leonard P., to Westinghouse Electric Corp. Brush tool. 4,577,361, Cl. 15-21.00R.

Horton, Robert L.: *See*—
McKee, Joseph M.; and Horton, Robert L., 4,577,908, Cl. 299-2.000.

Horvath, Mark P.: *See*—
Charalambous, Salomi T.; Horvath, Mark P.; House, Cathy P.; Iapicco, Jeffrey A.; Lue, Paul D.; and Verma, Shiv P., 4,578,796, Cl. 375-8.000.

Hosel, Peter; and Schindlbeck, Gunther, to Agfa-Gevaert AG. Apparatus for loading and unloading a film cassette, in particular an X-ray film cassette. 4,577,452, Cl. 53-266.00R.

Hoshizaki Electric Co., Ltd.: *See*—
Ishiguro, Fumio, 4,577,473, Cl. 62-347.000.

Hosogi, Yasuhiro: *See*—
Yutori, Toshiaki; Sudo, Masatoshi; Kato, Takehiko; and Hosogi, Yasuhiro, 4,578,124, Cl. 148-12.00F.

Hostettler, Fritz: *See*—
Fenster, Larry A.; and Hostettler, Fritz, 4,577,647, Cl. 132-39.000.

Hou, Kenneth C., to AMF Inc. Fibrous media containing millimicron-sized particulates. 4,578,150, Cl. 162-164.300.

House, Cathy P.: *See*—
Charalambous, Salomi T.; Horvath, Mark P.; House, Cathy P.; Iapicco, Jeffrey A.; Lue, Paul D.; and Verma, Shiv P., 4,578,796, Cl. 375-8.000.

House, David W.; and Scott, Ray V., Jr., to UOP Inc. Secondary aromatic diamines as curing agents in polyurethane manufacturing. 4,578,446, Cl. 528-64.000.

House Food Industrial Co., Ltd.: *See*—
Sugisawa, Ko; Shibuki, Masaru; Imada, Imayoshi; Katada, Jun; Yamamoto, Yozo; Nakajima, Setsuo; Kishi, Toshio; and Sugano, Shozo, 4,578,274, Cl. 426-96.000.

Hoving, Klaas; and Walterbos, Johannes W. M., to Exxon Research & Engineering Co. Preparation of zeolite coated substrates. 4,578,372, Cl. 502-74.000.

Howard, H. Taylor, to Chaparral Communications, Inc. Method and apparatus for optimizing feedhorn performance. 4,578,681, Cl. 343-786.000.

Howe, William C., Jr. Energy efficient window and skylight assemblies. 4,577,619, Cl. 126-431.000.

Howell, Edward K., to General Electric Company. Frequency selective filter circuit. 4,578,653, Cl. 333-166.000.

Howmedica, Inc.: *See*—
Huck, Charles M.; and Larrabee, Edward W., 4,578,060, Cl. 604-133.000.

Howmedica International, Inc.: *See*—
Harder, Hans E.; Behrens, Klaus; and Kotz, Rainer, 4,578,081, Cl. 623-22.000.

Howorth, David, to British Picker Company, Ltd., The. Floors. 4,577,448, Cl. 52-584.000.

Hsia, Steve; and Chang, Paul, to Monolithic Memories, Inc. Method of manufacturing CMOS devices. 4,577,391, Cl. 29-571.000.

Hsiung, Shu-Jen. Armchair with knocked down front legs. 4,577,906, Cl. 297-440.000.

Huang, Pao-Ter: *See*—
Stevens, Victor G.; and Huang, Pao-Ter, 4,577,575, Cl. 112-449.000.

Huang, Wann-Sheng; and Chien, Sze-Foo, to Texaco Inc. Method and apparatus for producing viscous hydrocarbons from a subterranean formation. 4,577,691, Cl. 166-263.000.

Hub City Iron Works, Inc.: *See*—
Castille, Alan J., 4,577,895, Cl. 285-334.000.

Hubert, Jacques: *See*—
de Guillenschmidt, Pierre; Hubert, Jacques; Goujon, Michel; and Saunier, Christian, 4,577,962, Cl. 356-5.000.

Hubner, Jochen; Knoth, Werner-Dieter; and Hullen, Helmut, to Veba-Glas AG. Applying a liquid to a glassware-making preform mold. 4,578,099, Cl. 65-26.000.

Huck, Charles M.; and Larrabee, Edward W., to Howmedica, Inc. Wound drainage device. 4,578,060, Cl. 604-133.000.

Huege, Fred R.; Slepetys, Richard A.; and Catone, David L., to Engelhard Corporation. Kaolin clay-based pigment. 4,578,118, Cl. 106-288.00B.

Huenig, Siegfried; and Aumueller, Alexander, to BASF Aktiengesellschaft. Charge transfer complexes of tetrathio/seleno-fulvalene derivatives and biscyanimine derivatives; biscyanimine derivatives and method for producing same. 4,578,220, Cl. 260-239.00R.

Hughes Aircraft Company: *See*—
Pastor, Ricardo C.; and Robinson, Morton, 4,578,252, Cl. 423-76.000.

Hughes, Dennis R., to A. O. Smith Corporation. Heat exchanger having a turbulator construction. 4,577,681, Cl. 165-109.100.

Hughes, Timothy C.: *See*—
Bray, Stuart W.; Hughes, Timothy C.; and Ariniello, Susan E., 4,577,811, Cl. 242-195.000.

Hughes Tool Company: *See*—
Reardon, Daniel R., 4,577,692, Cl. 166-321.000.
Hughes, William B.: *See*—
Holba, Albert G.; Doe, Susanne B.; and Hughes, William B., 4,577,492, Cl. 73-61.10C.
Hulbert, Matthew H.: *See*—
Srinivasan, Viswanathan; and Hulbert, Matthew H., 4,578,249, Cl. 423-10.000.
Hullen, Helmut: *See*—
Hubner, Jochen; Knoth, Werner-Dieter; and Hullen, Helmut, 4,578,099, Cl. 65-26.000.
Human Oltoanyagtermelo Es Kutato Intezet: *See*—
Csizer, Zoltan; Sikos, Karoly; Bacskai, Laszlo; Joo, Istvan; Niedermayer, Eleonora; Rethy, Lajos; and Zsidai, Jozsef, 4,578,270, Cl. 424-92.000.
Humber, Leslie G.: *See*—
Mobilio, Dominick; Demerson, Christopher A.; and Humber, Leslie G., 4,578,398, Cl. 514-411.000.
Humenick, John: *See*—
Higgs, Jacob K.; and Humenick, John, 4,578,692, Cl. 357-27.000.
Humphrey, William M., to Ex-Cell-O Corporation. Rim nylon-based urethane block polymer composition. 4,578,447, Cl. 528-73.000.
Hunter, Danny P. Vehicle mounted fire escape chute. 4,577,725, Cl. 182-48.000.
Hurd, William J., to United States of America, National Aeronautics and Space Administration. High dynamic global positioning system receiver. 4,578,678, Cl. 343-357.000.
Hurley, Timothy R.: *See*—
Stampwala, Suresh S.; French, James C.; Tunac, Josefino B.; Hurley, Timothy R.; and Bunge, Richard H., 4,578,383, Cl. 514-7.000.
Huseby, Irvin C.; and Bobik, Carl F., to General Electric Company. Pressureless sintering process to produce high thermal conductivity ceramic body of aluminum nitride. 4,578,232, Cl. 264-65.000.
Huseby, Irvin C.; and Bobik, Carl F., to General Electric Company. Pressureless sintering process to produce high thermal conductivity ceramic body of aluminum nitride. 4,578,233, Cl. 264-65.000.
Huseby, Irvin C.; and Bobik, Carl F., to General Electric Company. Process of pressureless sintering to produce dense high thermal conductivity ceramic body of deoxidized aluminum nitride. 4,578,234, Cl. 264-65.000.
Huseby, Irvin C.; and Bobik, Carl F., to General Electric Company. High thermal conductivity ceramic body of aluminum nitride. 4,578,364, Cl. 501-98.000.
Huseby, Irvin C.; and Bobik, Carl F., to General Electric Company. High thermal conductivity ceramic body of aluminum nitride. 4,578,365, Cl. 501-98.000.
Hustad, Gerald O.; Griesbach, Ray H.; and Anderson, James, to Oscar Mayer Foods Corporation. Grooved base package. 4,577,757, Cl. 206-461.000.
Hutchins, Burleigh M.; Buote, William J.; and Finn, Lawrence J., to Zymark Corporation. Self-configuring robotic system and method. 4,578,764, Cl. 364-513.000.
Hydraulic Servocontrols Corporation: *See*—
Blatner, John R., 4,577,652, Cl. 137-82.000.
Hydrel AG: *See*—
Metelski, Andrezej, 4,577,913, Cl. 308-6.00R.
Hydril Company: *See*—
Woods, Allan O., 4,578,669, Cl. 340-518.000.
Hydro-Quebec: *See*—
Armand, Michel; Muller, Daniel; Duval, Michel; and Harvey, Paul-Etienne, 4,578,326, Cl. 429-192.000.
Hydrolex, Inc.: *See*—
Lanmon, C. P., II, 4,577,687, Cl. 166-243.000.
Hylsa, S.A.: *See*—
Price-Falcon, Juan F.; and Viramontes-Brown, Ricardo, 4,578,110, Cl. 75-34.000.
Iapicco, Jeffrey A.: *See*—
Charalambous, Salomi T.; Horvath, Mark P.; House, Cathy P.; Iapicco, Jeffrey A.; Lue, Paul D.; and Verma, Shiv P., 4,578,796, Cl. 375-8.000.
Ibe, Hidefumi: *See*—
Kitamura, Masao; Nakayama, Norio; Katsura, Ryoei; Ibe, Hidefumi; and Uchida, Shunsuke, 4,578,154, Cl. 204-1.00T.
Ibrahim, Fayez F.; and Bowman, Edward E., to Tyler Refrigeration Corporation. Frost diffusion system for refrigeration apparatus. 4,577,467, Cl. 62-82.000.
Ichimura, Masatoshi, to Eagle Industry Company Limited. Automatic apparatus for pick-up sewing of curved edges of a fabric piece on clothing. 4,577,570, Cl. 112-121.120.
Ichimura, Takeshige: *See*—
Ueno, Masakazu; and Ichimura, Takeshige, 4,578,696, Cl. 357-59.000.
ICI Americas Inc.: *See*—
Lee, John T. M., 4,577,544, Cl. 89-1.140.
Idemitsu Petrochemical Co., Ltd.: *See*—
Miyazaki, Senji; and Touya, Osamu, 4,578,296, Cl. 428-35.000.
Ido, Tadashi: *See*—
Ito, Takeo; Ido, Tadashi; Takeuchi, Hajime; Hashimoto, Minoru; Maeda, Tatsumi; and Awa, Masashi, 4,578,313, Cl. 428-403.000.
Idzik, Joseph J.; and Kouse, Charles H., to Elliott Turbomachinery Co., Inc. Retracting internal tube cutter. 4,577,406, Cl. 30-103.000.
Ihara, Keiichi: *See*—
Harigane, Kotaro; Ihara, Keiichi; Ito, Tetsuro; and Shudo, Hirokazu, 4,578,010, Cl. 414-126.000.
Iijima, Shigeharu: *See*—
Sawamura, Mitsuharu; Ito, Susumu; Matsushima, Masaaki; Kishi, Hiroyoshi; Sasamori, Eizo; Yoshihara, Satoshi; Iijima, Shigeharu; and Takano, Katsuhiko, 4,578,322, Cl. 428-694.000.
Ikeda, Itsuo; Kurokawa, Junji; Hasebe, Mitsuo; Miyagawa, Seiichi; and Hariu, Hajime, to Ricoh Company, Ltd. Color image forming method. 4,578,331, Cl. 430-42.000.
Ikeda, Takahide: *See*—
Yazawa, Yoshiaki; Miyakawa, Nobuaki; Mukai, Toji; Ikeda, Takahide; and Kamei, Tatsuya, 4,578,693, Cl. 357-30.000.
Ikeda, Toshiya: *See*—
Irikura, Tsutomu; Nishino, Keigo; Suzue, Seigo; and Ikeda, Toshiya, 4,578,392, Cl. 514-300.000.
Ikegami, Seiji: *See*—
Nakano, Akihiko; Matsumoto, Hitoshi; Uda, Hiroshi; Komatsu, Yasumasa; Kuribayashi, Kiyoshi; and Ikegami, Seiji, 4,578,526, Cl. 136-251.000.
Ikegami, Tadashi: *See*—
Uno, Keiichi; Nagano, Hikoichi; and Ikegami, Tadashi, 4,578,166, Cl. 8-115.520.
Ikegawa, Akihiko: *See*—
Ohno, Shigeru; Kishimoto, Shinzo; Ikegawa, Akihiko; and Yagihara, Morio, 4,578,345, Cl. 430-393.000.
Ikemizu, Hiroshi, to NEC Corporation. Microwave integrated circuit and mounting device therefor. 4,577,923, Cl. 339-275.00B.
Ikemoto, Kazuhito; Terakura, Yukio; and Miyake, Takashi, to Toyota Jidosha Kabushiki Kaisha. Gear assembly for automobile transmission. 4,577,525, Cl. 74-440.000.
Ikenaga, Yukio: *See*—
Matsuoka, Masatoshi; Ikenaga, Yukio; and Matsuno, Osamu, 4,578,408, Cl. 524-91.000.
Ikram, Hafeez: *See*—
Vnek, John; Prince, Alfred M.; and Ikram, Hafeez, 4,578,217, Cl. 260-112.50R.
Illinois Tool Works Inc.: *See*—
Sygnator, Henry A., 4,577,359, Cl. 10-10.00R.
Imada, Imayoshi: *See*—
Sugisawa, Ko; Shibuki, Masaru; Imada, Imayoshi; Katada, Jun; Yamamoto, Yozo; Nakajima, Setsuo; Kishi, Toshio; and Sugano, Shozo, 4,578,274, Cl. 426-96.000.
Imai, Kazuhiro; Ogata, Hiroshi; Tanaka, Motoaki; Nawa, Hiroyoshi; and Ishihara, Masami, to Wako Pure Chemical Industries Ltd. Oxalic acid ester derivatives. 4,578,499, Cl. 560-21.000.
Imai, Tetsuya, to Otsuka Kagaku Kabushiki Kaisha. Herbicidal imidazolidine-2-one derivatives. 4,578,107, Cl. 71-92.000.
Imaino, Wayne I.; and Tam, Andrew C., to International Business Machines Corporation. Method and device for detecting a specific acoustic spectral feature. 4,577,503, Cl. 73-602.000.
Immunex Corporation: *See*—
Urdal, David L.; March, Carl J.; and Dower, Steven K., 4,578,335, Cl. 435-68.000.
Imperial Chemical Industries, PLC: *See*—
Dorrn, Clive, 4,577,998, Cl. 405-45.000.
Mabelis, Richard P., 4,578,483, Cl. 549-297.000.
Owen, David J., 4,577,803, Cl. 239-690.000.
Shepherd, David, 4,578,193, Cl. 210-656.000.
Imperial Clevite Inc.: *See*—
Shtarkman, Emile M., 4,577,842, Cl. 267-140.100.
Inagaki, Naoki, to Casio Computer Co., Ltd. Key-in device. 4,578,811, Cl. 382-11.000.
Inagaki, Yoshio: *See*—
Arai, Fuminori; Inagaki, Yoshio; and Kitajima, Masao, 4,578,245, Cl. 422-56.000.
Inductotherm Corporation: *See*—
Mortimer, John H., 4,578,552, Cl. 219-10.410.
Industrie Vernici Italiane S.p.A.: *See*—
Biorcio, Luciano; and Mensi, Carlo, 4,578,312, Cl. 428-336.000.
Ingersoll-Rand Company: *See*—
Melrose, David R.; and Russo, Mario A., 4,577,661, Cl. 137-625.330.
Ingham, Michael: *See*—
Lawson, Leslie E.; and Ingham, Michael, 4,577,948, Cl. 354-299.000.
Inman, Charles M.; and Stone, Donald J., to W. L. Gore & Assoc., Inc. Central venous catheter. 4,578,063, Cl. 604-175.000.
Inokuchi, Haruhisa; and Sakai, Takami, to Kabushiki Kaisha Toshiba. Converter control system having stable power transfer in the presence of decreased input AC voltage. 4,578,743, Cl. 363-35.000.
Inomata, Koichiro: *See*—
Sahashi, Masashi; Inomata, Koichiro; Sori, Naoyuki; and Yamamiya, Hideki, 4,578,125, Cl. 148-31.570.
Inoue, Hiroshi: *See*—
Komatsu, Shigeru; Inoue, Hiroshi; and Nakamura, Michio, 4,577,397, Cl. 29-576.00B.
Inoue-Japax Research Inc.: *See*—
Inoue, Kiyoshi, 4,578,555, Cl. 219-695.000.
Inoue, Kiyoshi, 4,578,556, Cl. 219-69.00M.
Inoue, Kiyoshi, to Inoue-Japax Research Inc. Fail-safe machine tool operational setting system with prerecorded verbal instructions. 4,578,555, Cl. 219-695.000.
Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. EDM method and apparatus utilizing water vapor. 4,578,556, Cl. 219-69.00M.
Inouye, Yoshio: *See*—
Ishikawa, Nobuo; Nakai, Takeshi; and Inouye, Yoshio, 4,578,503, Cl. 560-82.000.

Insituform Intl Inc: *See*—
Wood, Eric, 4,577,388, Cl. 29-558.000.
Institute of Gas Technology: *See*—
Tarman, Paul B., 4,578,176, Cl. 208-8.00R.
International Business Machines Corporation: *See*—
Ahn, Kie Y.; DiStefano, Thomas H.; and Jipson, Victor B., 4,578,788, Cl. 369-275.000.
Aviram, Ari; Dove, Derek B.; and Lane, Ramon, 4,577,983, Cl. 400-120.000.
Baker, David C.; Bantz, David F.; and Flurry, Gregory A., 4,578,674, Cl. 340-710.000.
Baumann, Thomas; Dacol, Frank H.; and Melcher, Robert L., 4,578,584, Cl. 250-341.000.
Behringer, Uwe; Bohlen, Harald; Nehmiz, Peter; and Zapka, Werner, 4,578,587, Cl. 250-492.200.
Betts, Alan J.; and Elliott, Peter J., 4,578,723, Cl. 360-77.000.
Chan, Yuen H.; and Struk, James R., 4,578,779, Cl. 365-190.000.
Chaplin, Russell, 4,577,508, Cl. 73-655.000.
Delaporte, Francois-Xavier; Lebesnerais, Gerard M.; and Pantani, Jean-Pierre, 4,578,695, Cl. 357-48.000.
Dewey, Anthony G.; and Marinelli, Charles P., 4,577,926, Cl. 350-96.250.
Flowers, Dale R., 4,578,671, Cl. 340-636.000.
Imaino, Wayne I.; and Tam, Andrew C., 4,577,503, Cl. 73-602.000.
Kasdagly, Dino G., 4,577,918, Cl. 339-17.00M.
Lovgren, Jeffrey L.; and Plummer, William B., 4,578,722, Cl. 360-60.000.
Makosch, Gunter, 4,577,968, Cl. 356-356.000.
O'Hara, Almerin C., Jr., 4,578,771, Cl. 364-716.000.
Yang, Kei-Hsiung, 4,577,930, Cl. 350-332.000.
Zingher, Arthur R., 4,578,279, Cl. 427-10.000.
International Business Machines Corp. (IBM): *See*—
Matsumoto, Takeshi, 4,578,720, Cl. 360-51.000.
International Business Machines (IBM): *See*—
White, James M.; May, Ronald W.; and Gulliver, Michael D., 4,578,711, Cl. 358-282.000.
International Cybernetics Corp.: *See*—
Jones, Donald H.; Allen, Spencer W.; and Chimes, Philip R., 4,578,763, Cl. 364-513.000.
International Minerals & Chemical Corp.: *See*—
Srinivasan, Viswanathan; and Hulbert, Matthew H., 4,578,249, Cl. 423-10.000.
International Paper Company: *See*—
Nadaskay, Richard J., 4,577,761, Cl. 206-604.000.
International Remote Imaging Systems, Inc.: *See*—
Faggin, Federico; Klein, Jerry A.; Yazolino, Lauren F.; Korody, Robert; Ha, Eric P. L.; and Kerman, Stephan, 4,578,537, Cl. 179-2.0DP.
International Standard Electric Corporation: *See*—
Gunther, Horst H.; and Oesterle, Hermann F., 4,578,547, Cl. 200-11.0DA.
International Teldata Corp: *See*—
Oliver, Stewart W.; and Cosgrove, John, 4,578,536, Cl. 179-2.0AM.
International Telephone and Telegraph Corporation: *See*—
Browning, James E., 4,577,909, Cl. 301-37.0TP.
Internatural Designs, Inc.: *See*—
Miner, Jon, 4,578,291, Cl. 428-8.000.
Intertechnique: *See*—
Beaussant, Raymond, 4,577,375, Cl. 24-580.000.
Intichar, Lutz: *See*—
Weghaupt, Erich; Intichar, Lutz; and Schnapper, Christoph, 4,577,871, Cl. 277-8.000.
Inui, Tsuneo: *See*—
Shimizu, Nobuyoshi; Fujimoto, Terunori; Inui, Tsuneo; and Ishida, Masatoki, 4,578,319, Cl. 428-632.000.
Irie, Nobuhiko, to Mitsubishi Jukogyo Kabushiki Kaisha. Apparatus for loading green tires. 4,578,023, Cl. 425-38.000.
Irikura, Tsutomu; Nishino, Keigo; Suzue, Seigo; and Ikeda, Toshiya, to Kyorin Pharmaceutical Co., Ltd. Pyrazolo[1,5-a]pyridine derivatives and anti-allergic compositions containing them. 4,578,392, Cl. 514-300.000.
Ishida, Masatoki: *See*—
Shimizu, Nobuyoshi; Fujimoto, Terunori; Inui, Tsuneo; and Ishida, Masatoki, 4,578,319, Cl. 428-632.000.
Ishiguro, Fumio, to Hoshizaki Electric Co., Ltd. Ice product making machine. 4,577,473, Cl. 62-347.000.
Ishihara, Masami: *See*—
Imai, Kazuhiro; Ogata, Hiroshi; Tanaka, Motoaki; Nawa, Hiroyoshi; and Ishihara, Masami, 4,578,499, Cl. 560-21.000.
Ishihara, Tamio: *See*—
Sakamoto, Masami; Nagumo, Ryoichi; and Ishihara, Tamio, 4,577,409, Cl. 33-18.100.
Ishihara, Yoshinobu; and Harada, Shinichi, to Kabushiki Kaisha Kobe Seiko Sho. Ceramic guide rolls for use in continuous casting. 4,577,675, Cl. 164-448.000.
Ishihara, Yoshinobu: *See*—
Harada, Shinichi; Ishihara, Yoshinobu; and Matsushita, Shigeru, 4,577,673, Cl. 164-448.000.
Ishii, Hajime: *See*—
Kizaki, Kanji; Ishii, Hajime; Taguchi, Noboru; and Kuwamoto, Hiroshi, 4,577,480, Cl. 72-8.000.
Ishii, Koji; and Maehara, Kenso, to Ryobi Ltd. Numbering device for offset press. 4,577,555, Cl. 101-76.000.
Ishii, Tamaki: *See*—
Takahashi, Yukoh; Fujii, Takeo; Shionoya, Masahisa; Yachigo, Shinichi; and Ishii, Tamaki, 4,578,410, Cl. 524-102.000.
Yoshimura, Masakatsu; Fujii, Takeo; Yachigo, Shinichi; and Ishii, Tamaki, 4,578,472, Cl. 546-188.000.
Ishikawa, Isao: *See*—
Kanda, Hiroshi; and Ishikawa, Isao, 4,577,504, Cl. 73-606.000.
Ishikawa, Kunio: *See*—
Omae, Yoshihiro; Ishikawa, Kunio; Fukao, Takahisa; and Yoshida, Katsushige, 4,577,385, Cl. 29-402.180.
Ishikawa, Nobuo; and Takahashi, Mitsuru, to Daikin Kogyo Co., Ltd.; and Toyo Soda Manufacturing Co., Ltd. Process for preparing a perfluorinated or polyfluorinated aliphatic carboxylic acid. 4,578,222, Cl. 260-413.000.
Ishikawa, Nobuo; Nakai, Takeshi; and Inouye, Yoshio, to Daikin Kogyo Co., Ltd. Alkylated or alkenylated malonic acid or its derivatives having a fluorine. 4,578,503, Cl. 560-82.000.
Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See*—
Kizaki, Kanji; Ishii, Hajime; Taguchi, Noboru; and Kuwamoto, Hiroshi, 4,577,480, Cl. 72-8.000.
Ishikura, Koji: *See*—
Hamashima, Yoshio; Ishikura, Koji; Kubota, Tadatoshi; and Minami, Kyoji, 4,578,378, Cl. 514-210.000.
Ishikuro, Tadashi; Shirahata, Ryuji; Miyoshi, Takahito; and Fujiyama, Masaaki, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,578,311, Cl. 428-336.000.
Ishimaru, Osamu, to Hisaka Works, Ltd. Apparatus for liquid flow treatment of fabrics. 4,578,085, Cl. 8-152.000.
Isozaki, Akio: *See*—
Sato, Yoshiyuki; Isozaki, Akio; Higo, Tomio; and Uchida, Tetsuo, 4,577,381, Cl. 29-157.400.
Istituto Gentili S.p.A.: *See*—
Rosini, Sergio, 4,578,376, Cl. 514-108.000.
Itek Corporation: *See*—
MacFarlane, James W.; and Smyth, Bruce E., 4,578,810, Cl. 382-8.000.
Ito, Eiichi, to TRW Ehrenreich GmbH & Co. KG. Ball joint. 4,577,989, Cl. 403-140.000.
Ito, Sho; Tatsumi, Kenji; Kasahara, Kumio; Nakaguchi, Tomoyuki; Takei, Toshio; and Nakahara, Shojiro, to Mitsubishi Denki Kabushiki Kaisha. Swing measuring device. 4,577,863, Cl. 273-26.00R.
Ito, Siro: *See*—
Komon, Koichi; Ito, Siro; and Seino, Shuichi, 4,578,290, Cl. 427-421.000.
Ito, Susumu: *See*—
Sawamura, Mitsuharu; Ito, Susumu; Matsushima, Masaaki; Kishi, Hiroyoshi; Sasamori, Eizo; Yoshihara, Satoshi; Iijima, Shigeharu; and Takano, Katsuhiko, 4,578,322, Cl. 428-694.000.
Ito, Takeo; Ido, Tadashi; Takeuchi, Hajime; Hashimoto, Minoru; Maeda, Tatsumi; and Awa, Masashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Powder for magnetic recording media and process for manufacturing the same. 4,578,313, Cl. 428-403.000.
Ito, Tetsuro: *See*—
Harigane, Kotaro; Ihara, Keiichi; Ito, Tetsuro; and Shudo, Hirokazu, 4,578,010, Cl. 414-126.000.
Itoh, Katsutoshi, to Kabushiki Kaisha Toshiba. X-ray diagnostic apparatus for allowing stereoscopic visualization on X-ray images of an object under examination. 4,578,802, Cl. 378-41.000.
ITT Corporation: *See*—
Middleton, Francisco A.; Carter, Nicholas J. R.; and Das, Santanu, 4,578,789, Cl. 370-58.000.
Sterns, William G., 4,578,652, Cl. 333-117.000.
ITT Industries, Inc.: *See*—
Burgdorf, Jochen; Birkenbach, Alfred; and Klimt, Ulrich, 4,577,731, Cl. 188-73.330.
Elmis, Herbert; and Backes, Reiner, 4,578,705, Cl. 358-148.000.
Magee, Terence E., 4,578,600, Cl. 307-451.000.
Prohaska, Hans; and Sosthene, Daniele, 4,578,741, Cl. 362-249.000.
ITW Ateco GmbH: *See*—
Wiese, Heiner; and Gramss, Rainer, 4,577,904, Cl. 297-410.000.
Iwai, Ken: *See*—
Kawata, Hiroitsu; Ohmura, Tadayoshi; Hasumi, Shunji; Konno, Yutaka; Aruga, Masayoshi; Tashiro, Seiki; Konno, Toshimitsu; and Iwai, Ken, 4,578,391, Cl. 514-256.000.
Iwami, Morita: *See*—
Kiyoto, Sumio; Nishikawa, Motoaki; Iwami, Morita; Terano, Hiroshi; and Kohsaka, Masanobu, 4,578,271, Cl. 424-117.000.
Iwasaki, Hirofumi: *See*—
Niki, Akira; and Iwasaki, Hirofumi, 4,578,307, Cl. 428-288.000.
Iwata, Hiroshi; and Makino, Hiroshi, to West Electric Co., Ltd. Ultrasonic distance measuring apparatus. 4,578,783, Cl. 367-99.000.
J. D. Tools, Inc.: *See*—
Michaud, Jeffrey J., 4,577,820, Cl. 248-211.000.
J. M. Huber Corporation: *See*—
Clem, Jack L.; and Scott, Oscar T., IV, 4,577,680, Cl. 165-95.000.
Jabarin, Saleh A., to Owens-Illinois, Inc. High barrier polymer blend and articles prepared therefrom. 4,578,295, Cl. 428-35.000.
Jabarin, Saleh A.: *See*—
Go, Santos W., deceased; and Jabarin, Saleh A., 4,577,768, Cl. 215-1.00C.
Jackman, Dennis E.; and Westphal, Dietmar B., to Mobay Chemical Corporation. Production of S-substituted isothioureas. 4,578,463, Cl. 544-182.000.
Jackovitz, John F.: *See*—
Peterson, Steven H.; and Jackovitz, John F., 4,578,165, Cl. 204-157.750.
Jackson Jordan, Inc.: *See*—
Jaeggi, Hans P., 4,577,494, Cl. 73-105.000.

Jackson, Melvin R.: *See*—
Siemers, Paul A.; Kopp, Robert W.; Jackson, Melvin R.; Duke, Steven R.; Perrin, David P.; and Liu, Ying H., 4,577,431, Cl. 42-76.00A.
Jackson, Theodore A., to Ex-Cell-O Corporation. Gun sight range extender. 4,577,546, Cl. 89-41.190.
Jackson, Winston J., Jr.; and Watkins, Joseph J., to Eastman Kodak Company. High molecular weight polyesters. 4,578,453, Cl. 528-302.000.
Jaeggi, Hans P., to Jackson Jordan, Inc. Apparatus and method for measuring the wear of railroad rail. 4,577,494, Cl. 73-105.000.
Jaffrin, Michel; and Reach, Gerard, to Centre National de la Recherche Scientifique. Bio-artificial ultrafiltration pancreas. 4,578,191, Cl. 210-323.200.
Jager, Gerhard; Bockmann, Klaus; Buchel, Karl H.; Brandes, Wilhelm; Frohberger, Paul-Ernst; and Scheinpflug, Hans, to Bayer Aktiengesellschaft. Fungicidal hydroxyalkinyl-azolyl derivatives. 4,578,396, Cl. 514-383.000.
Jager, Horst, to Bayer Aktiengesellschaft. Triphendioxazine dyestuffs. 4,578,461, Cl. 544-76.000.
Jahn-Held, Wilhelm: *See*—
Lindorfer, Walter; Jahn-Held, Wilhelm; Gerschler, Lutz J.; Jandel, Berthold; and Wartenpfuhl, Friedel, 4,577,999, Cl. 405-53.000.
James, Bertram G.; Dinapoli, Frank C.; and Hayes, Lloyd P., to Varian Associates, Inc. Slow wave circuit for a traveling wave tube. 4,578,620, Cl. 315-3.500.
James River Corporation of Virginia: *See*—
Kuchenbecker, Morris W., 4,577,762, Cl. 206-612.000.
Jandel, Berthold: *See*—
Lindorfer, Walter; Jahn-Held, Wilhelm; Gerschler, Lutz J.; Jandel, Berthold; and Wartenpfuhl, Friedel, 4,577,999, Cl. 405-53.000.
Janer, Patrick: *See*—
Lacour, Clement-Francois; and Janer, Patrick, 4,578,656, Cl. 333-204.000.
Janome Sewing Machine Co., Ltd.: *See*—
Hanyu, Susumu; and Kato, Kenji, 4,577,576, Cl. 112-456.000.
Takahashi, Yoshitaka, 4,577,574, Cl. 112-445.000.
Janvier, Dominique: *See*—
Barillec, Christian; Janvier, Dominique; and Bonneton, Marc, 4,578,013, Cl. 414-323.000.
Japan Spectroscopic Co., Ltd.: *See*—
Fukasawa, Yoshiro, 4,577,966, Cl. 356-325.000.
Jarreau, Francois X.; and Koenig, Jean-Jacques, to Etablissements Nativelle S.A. 4-acylamino-1-azaadamantanes, and compositions for use thereof in medicine. 4,578,382, Cl. 514-245.000.
Jarvis Products Corporation: *See*—
Hahn, A. David, 4,577,407, Cl. 30-180.000.
Jastrzebski, Lubomir L.: *See*—
Corboy, John F., Jr.; Jastrzebski, Lubomir L.; Blackstone, Scott C.; and Pagliaro, Robert H., Jr., 4,578,142, Cl. 156-612.000.
Jaworski, Bill L. Impact tool. 4,577,547, Cl. 91-39.000.
Jefferies, George S. Snowplowable road marker apparatus. 4,577,992, Cl. 404-16.000.
Jenkins, David P.: *See*—
Moore, Colin; and Jenkins, David P., 4,577,567, Cl. 110-347.000.
Jenkins, William A., to Monarch Marking Systems, Inc. Composite label web. 4,577,426, Cl. 40-21.00R.
Jennings, Thomas J. Anti-shock treatment method and garment. 4,577,622, Cl. 128-24.00R.
Jensen, Allen: *See*—
Lang, Paul W.; and Gribshaw, Franklin C., 4,578,709, Cl. 358-230.000.
Jensen, Norman P.; and Chang, Michael N., to Merck & Co., Inc. Hydroxybenzylamino derivatives as anti-inflammatory agents. 4,578,390, Cl. 514-255.000.
Jestrich, Hans-Achim; and Friedrich, Paul, to Kraftwerk Union Aktiengesellschaft. Special angle beam probe for ultrasonic testing. 4,577,505, Cl. 73-629.000.
Jestrich, Hans-Achim; and Werntgen, Ewald, to Kraftwerk Union Aktiengesellschaft. Method for the ultrasonic testing of discs shrink-fitted onto shafts in vicinity of shrink-fitted seats, and apparatus for carrying out the method. 4,577,507, Cl. 73-640.000.
Jipson, Victor B.: *See*—
Ahn, Kie Y.; DiStefano, Thomas H.; and Jipson, Victor B., 4,578,788, Cl. 369-275.000.
Jochum, Peter, to Hilti Aktiengesellschaft. Powder charge operated fastening element setting device. 4,577,793, Cl. 227-10.000.
Joergensen, Poul R. Alarm system for safeguarding against the breakthrough of a surface. 4,578,670, Cl. 340-550.000.
Joffe, Frederick M.: *See*—
Dysart, John K.; and Joffe, Frederick M., 4,578,073, Cl. 604-397.000.
Joh, Yasushi, to Nippon Zeon Co., Ltd. Blood pump applicable to an artifical heart. 4,578,077, Cl. 623-3.000.
Johenning, John B.; and Hall, Charles P., to Monterey Manufacturing Co. Waterbed mattress with baffle chambers. 4,577,356, Cl. 5-450.000.
John Manufacturing Limited: *See*—
Yuen, John S., 4,577,365, Cl. 15-339.000.
John Wyeth & Brother Limited: *See*—
Crossley, Roger, 4,578,480, Cl. 548-533.000.
Johnson, Cindy A.: *See*—
Sliwa, John W.; Burt, Roy J.; Lee, Chune; MacKay, John; and Johnson, Cindy A., 4,577,398, Cl. 29-590.000.
Johnson, Frederic A.: *See*—
Gray, Kevin; and Johnson, Frederic A., 4,577,667, Cl. 144-193.00C.
Johnson, Keith A.; and Kamlani, Vijay M., to Midland-Ross Corporation. Dimensionally stable movable furnace hearth. 4,578,031, Cl. 432-138.000.
Johnson, Marvin M.: *See*—
Kukes, Simon G.; Johnson, Marvin M.; Strope, Daniel J.; and Hogan, Robert J., 4,578,179, Cl. 208-110.000.
Johnson, Peter E.: *See*—
Bray, David J.; Johnson, Peter E.; Marshall, Peter E. G.; Piper, Francis R.; and Murdoch, Iain H., 4,577,490, Cl. 73-40.700.
Johnson Service Company: *See*—
Divjak, August A., Jr.; and Holdorf, Thomas C., 4,578,798, Cl. 375-45.000.
Pascucci, Gregory A.; and Kucharski, Paul G., 4,578,538, Cl. 179-2.0DP.
Johnson, Thomas A.; and Ford, Michael E., to Air Products and Chemicals, Inc. Polyalkylene polyamines from alkanolamine and ammonia or amines using group IIIB metal acid phosphate catalysts. 4,578,517, Cl. 564-479.000.
Johnsson, Gustaf E.: *See*—
Lindahl, Jonas A. I.; and Johnsson, Gustaf E., 4,578,147, Cl. 162-26.000.
Jones, Donald H.; Allen, Spencer W.; and Chimes, Philip R., to International Cybernetics Corp. Sampled data servo control system with deadband compensation. 4,578,763, Cl. 364-513.000.
Jones, Earl C. Snelled hook, fly, and lure holder. 4,577,433, Cl. 43-57.200.
Jones, Joyce D. Nail clippings receptacle. 4,577,754, Cl. 206-349.000.
Jones, Stanley P., to Emhart Industries, Inc. Manufacture of moulded articles of glassware. 4,578,104, Cl. 65-267.000.
Joo, Istvan: *See*—
Csizer, Zoltan; Sikos, Karoly; Bacskai, Laszlo; Joo, Istvan; Niedermayer, Eleonora; Rethy, Lajos; and Zsidai, Jozsef, 4,578,270, Cl. 424-92.000.
Judd, Richard E.: *See*—
Amabile, Robert N.; Judd, Richard E.; and Gromelski, Stanley J., Jr., 4,578,407, Cl. 524-55.000.
Jungerhans, Robert R. J., to C F Braun & Co. Process for ammonia syngas manufacture. 4,578,214, Cl. 252-376.000.
Junker, Erwin. Clamping device for a grinding ring. 4,577,440, Cl. 51-168.000.
Junker, Warren R.; Taszarek, Bruce J.; and Chizmar, David A., to Westinghouse Electric Corp. Simulation apparatus for eddy current inspection techniques. 4,578,643, Cl. 324-202.000.
Justice, David D.: *See*—
Miles, Ronald C.; Justice, David D.; and Dotson, Ronald L., 4,578,159, Cl. 204-98.000.
Juurmaa, Kimmo: *See*—
Lindqvist, Gustav; and Juurmaa, Kimmo, 4,578,000, Cl. 405-211.000.
Juzswik, David L.: *See*—
Floyd, William M.; and Juzswik, David L., 4,578,591, Cl. 307-10.00R.
K. K. Hanzawa Corporation: *See*—
Hanzawa, Tuneo, 4,577,528, Cl. 74-665.0GA.
Kabushiki Kaisha Ishida Koki Seisakusho: *See*—
Fukuda, Masao, 4,577,707, Cl. 177-25.000.
Kabushiki Kaisha Kobe Seiko Sho: *See*—
Fujisawa, Tetsuo, 4,578,029, Cl. 432-14.000.
Harada, Shinichi; Ishihara, Yoshinobu; and Matsushita, Shigeru, 4,577,673, Cl. 164-448.000.
Harada, Shinichi; Toyoda, Hiroshi; Honma, Katsuhiko; and Matsushita, Shigeru, 4,577,674, Cl. 164-448.000.
Ishihara, Yoshinobu; and Harada, Shinichi, 4,577,675, Cl. 164-448.000.
Sato, Yoshiyuki; Isozaki, Akio; Higo, Tomio; and Uchida, Tetsuo, 4,577,381, Cl. 29-157.400.
Yutori, Toshiaki; Sudo, Masatoshi; Kato, Takehiko; and Hosogi, Yasuhiro, 4,578,124, Cl. 148-12.00F.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Abe, Riichi; Tsuruta, Katsuji; and Tsujikado, Seiji, 4,578,748, Cl. 364-167.000.
Baba, Kiyokazu, 4,577,486, Cl. 72-421.000.
Tokunaga, Noriyasu, 4,577,714, Cl. 180-70.100.
Kabushiki Kaisha Sankosha: *See*—
Shigemori, Daizo; Kunii, Haruo; and Endo, Masaaki, 4,578,733, Cl. 361-120.000.
Kabushiki Kaisha Toshiba: *See*—
Aoki, Hidehiko, 4,578,633, Cl. 323-315.000.
Inokuchi, Haruhisa; and Sakai, Takami, 4,578,743, Cl. 363-35.000.
Itoh, Katsutoshi, 4,578,802, Cl. 378-41.000.
Nakamura, Taizo; and Kawahara, Katsuyuki, 4,578,017, Cl. 415-1.000.
Shibata, Tadashi, 4,577,395, Cl. 29-576.00C.
Tojo, Toru; and Sugihara, Kazuyoshi, 4,578,607, Cl. 310-328.000.
Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Kuno, Toshitaka; and Kamiya, Atsushi, 4,578,749, Cl. 364-167.000.
Kafri, Oded: *See*—
Krasinski, Jerzy S.; Heller, Donald F.; and Kafri, Oded, 4,577,940, Cl. 350-502.000.
Kagami, Isao: *See*—
Yamamoto, Takemi; Kuzuya, Susumu; Kagami, Isao; and Takenaka, Yuuichi, 4,577,984, Cl. 400-625.000.
Kaiser Aluminum Chemical Corporation: *See*—
Roe, William J.; and Malito, John T., 4,578,255, Cl. 423-130.000.
Kaiser, Jurgen: *See*—
Kinzler, Hans; and Kaiser, Jurgen, 4,578,664, Cl. 336-90.000.

Kaiser Steel Corporation: *See*—
Powers, Joseph E.; and Williamson, Calvin C., 4,577,796, Cl. 228-102.000.
Kajiwara, Norio, to Ricoh Company, Ltd. Two-color copying apparatus. 4,577,954, Cl. 355-4.000.
Kakeya, Noboru: *See*—
Fukui, Kiyoshi; Kakeya, Noboru; and Taguchi, Mitsushi, 4,578,479, Cl. 548-269.000.
Kakinoki, Hideo; and Ona, Isao, to Toray Silicone Co., Ltd. Fiber-treating method and composition therefor comprising epoxy-silicone and acrylamide resin. 4,578,084, Cl. 8-115.610.
Kalnin, Ilmar L.; Goldberg, Harris A.; and Williams, Clyde C., to Celanese Corporation. Electrical temperature pyrolyzed polymer material detector and associated circuitry. 4,577,979, Cl. 374-178.000.
Kaltenbach & Voight GmbH & Co.: *See*—
Mossle, Walter; and Eibofner, Eugen, 4,578,033, Cl. 433-29.000.
Kalz, Hans-Jurgen: *See*—
Rieck, Hans-Peter; and Kalz, Hans-Jurgen, 4,578,371, Cl. 502-71.000.
Kamei, Tatsuya: *See*—
Yezawa, Yoshiaki; Miyakawa, Nobuaki; Mukai, Toji; Ikeda, Takahide; and Kamei, Tatsuya, 4,578,693, Cl. 357-30.000.
Kamezaki, Yasushi, to Mita Industrial Co., Ltd. Developing apparatus. 4,577,587, Cl. 118-658.000.
Kamiya, Atsushi: *See*—
Kuno, Toshitaka; and Kamiya, Atsushi, 4,578,749, Cl. 364-167.000.
Kamlani, Vijay M.: *See*—
Johnson, Keith A.; and Kamlani, Vijay M., 4,578,031, Cl. 432-138.000.
Kamyr, Inc.: *See*—
Prough, J. Robert; and Torregrossa, Louis O., 4,577,974, Cl. 366-307.000.
Kanai, Tsutomu, to Clarion Co., Ltd. Subscription television system. 4,578,703, Cl. 358-117.000.
Kanakura, Akihiro: *See*—
Umemoto, Hirotoshi; Tanabe, Hisaki; Kanakura, Akihiro; and Nakano, Shinji, 4,578,436, Cl. 525-443.000.
Kanamaru, Tatsuya; Nakayama, Motohiro; Ogawa, Yutaka; and Arai, Katutoshi A., to Nippon Steel Corporation. Process for electroplating a metallic material with an iron-zinc alloy. 4,578,158, Cl. 204-44.200.
Kanamori, Hiroshi, to Nissan Motor Co., Ltd. Resin molding decorative member. 4,578,292, Cl. 428-31.000.
Kanda, Hiroshi; and Ishikawa, Isao, to Hitachi, Ltd. Acoustic microscope. 4,577,504, Cl. 73-606.000.
Kane, Thomas J.; and Byer, Robert L., to Leland Stanford Junior University, The Board of Trustees of the. Solid-state non-planar internally reflecting ring laser. 4,578,793, Cl. 372-94.000.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Furukawa, Hisao; Okada, Keiko; Kawamura, Joe; and Kato, Yasushi, 4,578,417, Cl. 524-378.000.
Kanno, Hideo: *See*—
Yamaguchi, Hisao; Kanno, Hideo; Okamiya, Yoshiaki; and Sunakawa, Kiyotaka, 4,578,395, Cl. 514-356.000.
Kao Corporation: *See*—
Fujii, Kozo; and Okumura, Takeo, 4,578,216, Cl. 252-542.000.
Murai, Osamu; and Moriyama, Noboru, 4,578,441, Cl. 526-216.000.
Karmarkar, Subhash D.: *See*—
Divecha, Amarnath P.; Karmarkar, Subhash D.; and Foltz, John V., 4,578,287, Cl. 427-250.000.
Karol, Herman S., to Westinghouse Electric Corp. Guide rail clamping assembly. 4,577,729, Cl. 187-95.000.
Kasahara, Kumio: *See*—
Ito, Sho; Tatsumi, Kenji; Kasahara, Kumio; Nakaguchi, Tomoyuki; Takei, Toshio; and Nakahara, Shojiro, 4,577,863, Cl. 273-26.00R.
Kasai, Kazumi, to Nippon Notion Kogyo Co., Ltd. Buckle for straps. 4,577,377, Cl. 24-625.000.
Kasdagly, Dino G., to International Business Machines Corporation. Copper and dual durometer rubber multiple connector. 4,577,918, Cl. 339-17.00M.
Kasielke, Joachim: *See*—
van Rijckevorsel, Rainer; Kasielke, Joachim; Macho, Heinz; Schafer, Peter; and Nenninger, Klaus, 4,578,716, Cl. 360-1.000.
Kasori, Yukio: *See*—
Wada, Keisuke; Kobayashi, Yoshimitsu; and Kasori, Yukio, 4,578,507, Cl. 560-104.000.
Kassai Kabushikikaisha: *See*—
Kassai, Kenzou, 4,577,355, Cl. 5-93.00R.
Kassai, Kenzou, 4,577,877, Cl. 280-47.37R.
Kassai, Kenzou, to Kassai Kabushikikaisha. Frame structure for baby carriage bed. 4,577,355, Cl. 5-93.00R.
Kassai, Kenzou, to Kassai Kabushikikaisha. Pushcart handle height adjusting mechanism. 4,577,877, Cl. 280-47.37R.
Kastl, Alfons: *See*—
Geyken, Erwin; Heckl, Franz; Kastl, Alfons; Lehnert, Klaus; and Loistl, Rudolf, 4,577,949, Cl. 354-319.000.
Katada, Jun: *See*—
Sugisawa, Ko; Shibuki, Masaru; Imada, Imayoshi; Katada, Jun; Yamamoto, Yozo; Nakajima, Setsuo; Kishi, Toshio; and Sugano, Shozo, 4,578,274, Cl. 426-96.000.
Kathriner, Josef, to Sulzer Brothers Limited. Weft yarn tensioning device. 4,577,666, Cl. 139-450.000.
Katkocin, Dennis M.; Word, Nancy S.; and Yang, Shiow-Shong, to CPC International Inc. Novel thermostable, aciduric alpha-amylase and method for its production. 4,578,352, Cl. 435-99.000.
Kato, Akira: *See*—
Mori, Toshikatsu; Takeuchi, Seizi; Matsuda, Shimpei; Kumagi, Teruo; Kato, Akira; Yamashita, Hisao; and Takeuchi, Masato, 4,578,112, Cl. 75-108.000.
Kato, Hisatoyo: *See*—
Tanaka, Hiroshi; and Kato, Hisatoyo, 4,578,581, Cl. 250-327.200.
Kato, Kenji: *See*—
Hanyu, Susumu; and Kato, Kenji, 4,577,576, Cl. 112-456.000.
Kato, Mikihiko; Okita, Tsutomu; Komine, Shigeo; Okuzawa, Yasutoshi; and Morita, Kazuhiko, to Fuji Photo Film Co., Ltd. Flexible magnetic disk sheet. 4,578,299, Cl. 428-65.000.
Kato, Nobuhide; and Murase, Takao, to NGK Insulators, Ltd. Oxygen sensor with heater. 4,578,174, Cl. 204-429.000.
Kato, Takehiko: *See*—
Yutori, Toshiaki; Sudo, Masatoshi; Kato, Takehiko; and Hosogi, Yasuhiro, 4,578,124, Cl. 148-12.00F.
Kato, Yasushi: *See*—
Furukawa, Hisao; Okada, Keiko; Kawamura, Joe; and Kato, Yasushi, 4,578,417, Cl. 524-378.000.
Katsura, Ryoei: *See*—
Kitamura, Masao; Nakayama, Norio; Katsura, Ryoei; Ibe, Hidefumi; and Uchida, Shunsuke, 4,578,154, Cl. 204-1.00T.
Kaufman, Glenn A.: *See*—
Grover, Donald D.; and Kaufman, Glenn A., 4,577,496, Cl. 73-119.00A.
Kaufman, Lance R. Method of mounting a compact circuit package to a heat sink or the like. 4,577,387, Cl. 29-458.000.
Kawabe, Yuzo, to Shimano Industrial Company Limited. Spinning reel brake. 4,577,808, Cl. 242-84.50R.
Kawahara, Katsuyuki: *See*—
Nakamura, Taizo; and Kawahara, Katsuyuki, 4,578,017, Cl. 415-1.000.
Kawamura, Fumio: *See*—
Gotou, Tadashi; Kawamura, Fumio; Sagawa, Norihiko; and Yusa, Hideo, 4,578,325, Cl. 429-91.000.
Kawamura, Joe: *See*—
Furukawa, Hisao; Okada, Keiko; Kawamura, Joe; and Kato, Yasushi, 4,578,417, Cl. 524-378.000.
Kawasaki, Masahiro: *See*—
Urano, Fumio; Okura, Zenichi; and Kawasaki, Masahiro, 4,577,952, Cl. 354-455.000.
Kawasaki Steel Corporation: *See*—
Yudate, Kozo; and Nagasawa, Ken, 4,578,177, Cl. 208-45.000.
Kawata, Hiroitsu; Ohmura, Tadayoshi; Hasumi, Shunji; Konno, Yutaka; Aruga, Masayoshi; Tashiro, Seiki; Konno, Toshimitsu; and Iwai, Ken, to Yamanouchi Pharmaceutical Co., Ltd. Oily compositions of antitumor drugs. 4,578,391, Cl. 514-256.000.
Kawata, Toshikatsu: *See*—
Sakurai, Masanori; Miyawaki, Junichi; Umemura, Toshikaju; Kawata, Toshikatsu; and Kiboshi, Shinji, 4,578,422, Cl. 524-593.000.
Kay-Fries, Inc.: *See*—
Rummo, Gregory J.; and Startup, Robert, 4,578,488, Cl. 556-56.000.
Kazaoka, Kenichi: *See*—
Nakazawa, Takaaki; Kazaoka, Kenichi; Okazaki, Nobuo; and Nakashima, Kunihiko, 4,578,592, Cl. 307-10.00R.
Kazuta, Hisashi: *See*—
Nomura, Kazuhiko; Kazuta, Hisashi; and Kimura, Hiroshi, 4,577,719, Cl. 180-219.000.
Kearney, Anthony D., to F. F. Seeley Nominees Pty Ltd. Air cooler adaptor. 4,577,470, Cl. 62-259.400.
Keating, Esmond J.: *See*—
Lambert, Allan H.; Keating, Esmond J.; and Verburg, Gerald B., 4,577,476, Cl. 68-5.00D.
Kedem, Tuval, to Equipment Company of America. Pallet truck with hydraulic lift. 4,577,463, Cl. 60-426.000.
Keebler Company: *See*—
Krubert, George J., 4,578,273, Cl. 426-87.000.
Keen, Brian T., to Union Carbide Corporation. Carbon dioxide-enhanced monoalkylene glycol production. 4,578,524, Cl. 568-867.000.
Kelch, Heinz, to Kienzle Apparate GmbH. Heat exchanger with separate helical ducts. 4,577,683, Cl. 165-164.000.
Keller, Heimo; Keppler, Bernhard; Kruger, Uwe; and Linder, Rudolf, to Byk Gulden Lomberg Chemische Fabrik GmbH. Mental complexes having an antineoplastic action, and medicaments containing these complexes. 4,578,401, Cl. 514-49.000.
Keller, Jack; and Stringham, Glen E., to Utah State University Foundation. Method and system for furrow irrigation. 4,577,802, Cl. 239-11.000.
Kemeny, George A., to Westinghouse Electric Corp. Parallel rail electromagnetic launcher with multiple current path armature. 4,577,545, Cl. 89-8.000.
Kennecott Corporation: *See*—
Campos-Loriz, Diego, 4,578,363, Cl. 501-89.000.
Kenney, George B. Apparatus for in-process multi-element analysis of molten metal and other liquid materials. 4,578,022, Cl. 425-7.000.
Keppler, Bernhard: *See*—
Keller, Heimo; Keppler, Bernhard; Kruger, Uwe; and Linder, Rudolf, 4,578,401, Cl. 514-49.000.
Kerb, Ulrich: *See*—
Furst, Andor; Muller, Marcel; Kerb, Ulrich; and Wiechert, Rudolf, 4,578,475, Cl. 548-126.000.

Kerman, Stephan: *See*—
Faggin, Federico; Klein, Jerry A.; Yazolino, Lauren F.; Korody, Robert; Ha, Eric P. L.; and Kerman, Stephan, 4,578,537, Cl. 179-2.0DP.

Kerr, Charles, III; and Forell, Mark, to Astronics Corporation. Electroluminescent panels. 4,578,617, Cl. 313-512.000.

Kerr-McGee Chemical Corporation. *See*—
Puri, Avinash D.; Fairchild, James L.; and Rodosevich, James B., 4,578,086, Cl. 23-300.000.
Rado, Theodore A., 4,578,090, Cl. 55-48.000.

Kiboshi, Shinji: *See*—
Sakurai, Masanori; Miyawaki, Junichi; Umemura, Toshikaju; Kawata, Toshikatsu; and Kiboshi, Shinji, 4,578,422, Cl. 524-593.000.

Kidde, Inc.: *See*—
Greenwald, Harry; and Lier, Pierre, 4,578,548, Cl. 200-38.00F.

Kienzle Apparate GmbH: *See*—
Adams, Jurgen; and Scholl, Hans-Peter, 4,578,760, Cl. 364-467.000.
Kelch, Heinz, 4,577,683, Cl. 165-164.000.

Kim, Myong H., to Woo Kyong Industrial Co., Ltd. Refuse receptacle. 4,577,778, Cl. 220-404.000.

Kimberly-Clark Corporation: *See*—
O'Connor, James J., 4,578,066, Cl. 604-366.000.
Oshefsky, Daniel J.; Gavronski, Paul A.; Vogt, Robert E.; and Rajala, Gregory J., 4,578,133, Cl. 156-164.000.
Whitehead, Howard A.; and Braun, Ralph V., 4,578,069, Cl. 604-370.000.

Kimoto, Masahiko: *See*—
Hamane, Masumi; and Kimoto, Masahiko, 4,577,720, Cl. 180-229.000.

Kimura, Hiroshi: *See*—
Nomura, Kazuhiko; Kazuta, Hisashi; and Kimura, Hiroshi, 4,577,719, Cl. 180-219.000.

Kimura, Quanbee, to Yoshizuka Seiki Co., Ltd. Spindle device. 4,577,981, Cl. 384-495.000.

Kimura, Seiji: *See*—
Nishida, Susumu; Kimura, Seiji; Kobayashi, Akio; and Fuchigami, Tadashi, 4,577,915, Cl. 312-214.000.

Kimura, Sosaku; and Hatsuse, Toshikazu, to Citizen Watch Co., Ltd. Hydrostatic pressure XY table. 4,577,845, Cl. 269-73.000.

King, Martin J.; and Troutner, Vernon H., to Extracorporeal Medical Specialties, Inc. Patient photopheresis treatment apparatus and method. 4,578,056, Cl. 604-6.000.

Kingston, Samuel B.: *See*—
Postle, Stephen R.; and Kingston, Samuel B., 4,578,305, Cl. 428-212.000.

Kinoshita, Yuji: *See*—
Hanada, Koji; Kinoshita, Yuji; and Tamura, Masaru, 4,578,660, Cl. 335-133.000.

Kinzler, Hans; and Kaiser, Jurgen, to Siemens Aktiengesellschaft. Radio interference suppression choke with a low leakage field. 4,578,664, Cl. 336-90.000.

Kirtley, Stephen W.; and Wooster, George S., to Allied Corporation. Polymeric boron nitrogen dopant. 4,578,283, Cl. 427-85.000.

Kiser, T. Kay: *See*—
Saccocio, Edward J.; Kiser, T. Kay; Wright, Richard F.; and Head, Donald L., 4,578,340, Cl. 430-138.000.

Kishi, Hiroyoshi: *See*—
Sawamura, Mitsuharu; Ito, Susumu; Matsushima, Masaaki; Kishi, Hiroyoshi; Sasamori, Eizo; Yoshihara, Satoshi; Iijima, Shigeharu; and Takano, Katsuhiko, 4,578,322, Cl. 428-694.000.

Kishi, Toshio: *See*—
Sugisawa, Ko; Shibuki, Masaru; Imada, Imayoshi; Katada, Jun; Yamamoto, Yozo; Nakajima, Setsuo; Kishi, Toshio; and Sugano, Shozo, 4,578,274, Cl. 426-96.000.

Kishimoto, Shinzo: *See*—
Ohno, Shigeru; Kishimoto, Shinzo; Ikegawa, Akihiko; and Yagihara, Morio, 4,578,345, Cl. 430-393.000.

Kisokascisangyou Co., Ltd.: *See*—
Nagafuchi, Kazumasa, 4,578,298, Cl. 428-40.000.

Kiss, Akos; Kleinschmit, Peter; Volker, Werner; and Halbritter, Gunter, to Degussa Aktiengesellschaft. Lead activated luminescent material and process for its production. 4,578,212, Cl. 252-301.40F.

Kitajima, Masao: *See*—
Arai, Fuminori; Inagaki, Yoshio; and Kitajima, Masao, 4,578,245, Cl. 422-56.000.

Kitamura, Masao; Nakayama, Norio; Katsura, Ryoei; Ibe, Hidefumi; and Uchida, Shunsuke, to Hitachi, Ltd.; and Hitachi Engineering Co., Ltd. Method and apparatus for measuring dissolved gas concentrations. 4,578,154, Cl. 204-1.00T.

Kitta, Toshiyuki; Abe, Wataru; and Takase, Tadaaki, to Oiles Industry Co., Ltd. Metallic sheath for posttensioning method. 4,577,443, Cl. 52-230.000.

Kiyonaga, Bunzo, to Epson Corporation. Liquid crystal composition. 4,577,931, Cl. 350-350.00R.

Kiyonaga, Norio. Golf swing training device with visual and audible alerts. 4,577,868, Cl. 273-183.00A.

Kiyoto, Sumio; Nishikawa, Motoaki; Iwami, Morita; Terano, Hiroshi; and Kohsaka, Masanobu, to Fujisawa Pharmaceutical Co., Ltd. Biologically active WS 6049 substances, a process for the production thereof and their pharmaceutical compositions. 4,578,271, Cl. 424-117.000.

Kizaki, Kanji; Ishii, Hajime; Taguchi, Noboru; and Kuwamoto, Hiroshi, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha; and Nippon Kokan Kabushiki Kaisha. Method and apparatus for controlling rolling correction in rolling mill. 4,577,480, Cl. 72-8.000.

Klabunde, Steven E.; Hankwitz, Edward H.; and Maastricht, Charles, to AMCA International Corporation. Contouring machine with radial slide head. 4,577,535, Cl. 82-2.00E.

Klak, Roland, to Daimler-Benz Aktiengesellschaft. Glow plug arrangement. 4,577,601, Cl. 123-298.000.

Klausz, Remy, to Thomson CSF. Tomodensitometer for image display in the dynamic mode. 4,578,752, Cl. 364-414.000.

Kleeberg, Wolfgang; Hauschildt, Klaus-Robert; Hacker, Heinz; and Kretzschmar, Klaus, to Siemens Aktiengesellschaft. Method for manufacturing epoxy resin molded materials. 4,578,452, Cl. 528-297.000.

Klein, Jerry A.: *See*—
Faggin, Federico; Klein, Jerry A.; Yazolino, Lauren F.; Korody, Robert; Ha, Eric P. L.; and Kerman, Stephan, 4,578,537, Cl. 179-2.0DP.

Klein, Joseph T.: *See*—
Allen, Richard C.; Effland, Richard C.; and Klein, Joseph T., 4,578,394, Cl. 514-332.000.

Klein, Roy S.; Gehly, Joel C.; and Sestak, Joseph T., to American Sterilizer Company. Removable lampholder. 4,578,742, Cl. 362-294.000.

Kleine, Heinz: *See*—
Grunst, Heinz; and Kleine, Heinz, 4,578,549, Cl. 200-76.000.

Kleinschmit, Peter: *See*—
Kiss, Akos; Kleinschmit, Peter; Volker, Werner; and Halbritter, Gunter, 4,578,212, Cl. 252-301.40F.
Panster, Peter; and Kleinschmit, Peter, 4,578,496, Cl. 556-479.000.

Kliman, Gerald B.; and Plunkett, Allan B., to General Electric Company. Synchronous disk motor with amorphous metal stator and permanent magnet rotor and flywheel. 4,578,610, Cl. 310-156.000.

Klimczak, William J., to Wehr Corporation. Method and apparatus for improving the operation of a dust collector. 4,578,092, Cl. 55-302.000.

Klimt, Ulrich: *See*—
Burgdorf, Jochen; Birkenbach, Alfred; and Klimt, Ulrich, 4,577,731, Cl. 188-73.330.

Klosterhuber, Rolf; and Herrle, Wolfgang. Process for the chaotic filming of documents and device for the completion thereof. 4,577,956, Cl. 355-40.000.

Knapp, John F.: *See*—
Gruber, Robert J.; Koch, Ronald J.; and Knapp, John F., 4,578,338, Cl. 430-120.000.

Knecht, Heinz: *See*—
Meller, Theo; Knecht, Heinz; and Kuchheuser, Werner, 4,577,840, Cl. 267-64.170.

Knecht, Thomas A.; Frick, Roger L.; and Schulte, John P. Pressure sensing cell using brittle diaphragm. 4,578,735, Cl. 361-283.000.

Knight, George W.: *See*—
Sawyer, Lawrence H.; and Knight, George W., 4,578,414, Cl. 524-310.000.

Knight, Paul A.: *See*—
Peel, John D.; and Knight, Paul A., 4,578,199, Cl. 210-788.000.

Knight, Trevor V., to Labtest Equipment Co. (S.E. Asia) Pty. Ltd. Nebulizer. 4,577,517, Cl. 73-864.810.

Knoblauch, Karl: *See*—
Richter, Ekkehard; Korbacher, Werner; Knoblauch, Karl; Giessler, Klaus; and Harder, Klaus-Burkhard, 4,578,089, Cl. 55-26.000.

Knoth, Werner-Dieter: *See*—
Hubner, Jochen; Knoth, Werner-Dieter; and Hullen, Helmut, 4,578,099, Cl. 65-26.000.

Knudsen, Irving E.: *See*—
Shuck, David L.; and Knudsen, Irving E., 4,577,972, Cl. 366-101.000.

Kobayashi, Akio: *See*—
Nishida, Susumu; Kimura, Seiji; Kobayashi, Akio; and Fuchigami, Tadashi, 4,577,915, Cl. 312-214.000.

Kobayashi, Hidetoshi: *See*—
Takita, Hitoshi; Noda, Sakuo; Mukaida, Yutaka; and Kobayashi, Hidetoshi, 4,578,404, Cl. 514-567.000.

Kobayashi, Jiro: *See*—
Eguchi, Kenzo; and Kobayashi, Jiro, 4,578,563, Cl. 219-273.000.

Kobayashi, Kazufumi: *See*—
Aoyagi, Masao; Kobayashi, Kazufumi; and Yasuda, Keiichi, 4,577,934, Cl. 350-430.000.

Kobayashi, Yoshimitsu: *See*—
Wada, Keisuke; Kobayashi, Yoshimitsu; and Kasori, Yukio, 4,578,507, Cl. 560-104.000.

Kober, Kurt; Wohrle, Rudolf; and Kohler, Robert, to Alois Kober KG. Tractor trailer combination with a coupling connection. 4,577,882, Cl. 280-446.00R.

Koch, Ronald J.: *See*—
Gruber, Robert J.; Koch, Ronald J.; and Knapp, John F., 4,578,338, Cl. 430-120.000.

Kock, Ronald W.: *See*—
Kramer, Timothy A.; Young, Gerald A.; and Kock, Ronald W., 4,578,068, Cl. 604-368.000.

Kocks Technik GmbH & Co.: *See*—
Staat, Karlhans, 4,577,481, Cl. 72-68.000.

Kodama, Minekazu: *See*—
Hani, Kiyoshi; Takei, Takako; Kodama, Minekazu; and Sugano, Toshiyuki, 4,578,308, Cl. 428-297.000.

Kodama, Naoki: *See*—
Suzuki, Ryo; Sugita, Yutaka; Takeuchi, Teruaki; Kodama, Naoki; Takeshita, Masatoshi; and Umezaki, Hiroshi, 4,578,775, Cl. 365-36.000.

Koehler, Charles W.; vanOmmering, Gerrit; and Puester, Neil H., to Ford Aerospace & Communications Corporation. Active cooling system for electrochemical cells. 4,578,324, Cl. 429-26.000.

Koenig, Jean-Jacques: *See*—
Jarreau, Francois X.; and Koenig, Jean-Jacques, 4,578,382, Cl. 514-245.000.

Koerner, Gotz: *See*—
Rott, Hans; Koerner, Gotz; and Schmidt, Gunter, 4,578,116, Cl. 106-18.120.

Koga, Keiko: *See*—
Ohigashi, Hiroji; Koga, Keiko; and Nakanishi, Toshiharu, 4,578,442, Cl. 526-255.000.

Kohler, Robert: *See*—
Kober, Kurt; Wohrle, Rudolf; and Kohler, Robert, 4,577,882, Cl. 280-446.00R.

Kohne, Bernd: *See*—
Praefcke, Klaus; Kohne, Bernd; Poules, Wadi; Eidenschink, Rudolf; and Scheuble, Bernhard, 4,578,210, Cl. 252-299.600.

Kohsaka, Masanobu: *See*—
Kiyoto, Sumio; Nishikawa, Motoaki; Iwami, Morita; Terano, Hiroshi; and Kohsaka, Masanobu, 4,578,271, Cl. 424-117.000.

Kokan Kikai Kogyo Kabushiki Kaisha: *See*—
Wakabayashi, Senzo, 4,577,785, Cl. 222-598.000.

Koller, Paul L.: *See*—
Laszlo, Hideg; and Koller, Paul L., 4,578,747, Cl. 364-151.000.

Kollross, Gunter. Method and apparatus for opening axially shirring and dividing off thin-walled, cord-shaped tubular casing material, especially casings made of synthetic material, for the sausage manufacture. 4,577,370, Cl. 17-49.000.

Komastu, Makoto: *See*—
Uchida, Minoru; Komastu, Makoto; and Nakagawa, Kazuyuki, 4,578,381, Cl. 514-233.000.

Komatsu, Shigeru; Inoue, Hiroshi; and Nakamura, Michio, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for manufacturing a semiconductor device having vertical and lateral transistors. 4,577,397, Cl. 29-576.00B.

Komatsu, Yasumasa: *See*—
Nakano, Akihiko; Matsumoto, Hitoshi; Uda, Hiroshi; Komatsu, Yasumasa; Kuribayashi, Kiyoshi; and Ikegami, Seiji, 4,578,526, Cl. 136-251.000.

Komet Stahlhalter-und Werkzeugfabrik Robert Breuning GmbH: *See*—
Eckle, Otto, 4,578,003, Cl. 408-56.000.

Kominami, Hideyuki: *See*—
Yamashita, Hidekazu; and Kominami, Hideyuki, 4,578,553, Cl. 219-10.770.

Komine, Shigeo: *See*—
Kato, Mikihiko; Okita, Tsutomu; Komine, Shigeo; Okuzawa, Yasutoshi; and Morita, Kazuhiko, 4,578,299, Cl. 428-65.000.

Komon, Koichi; Ito, Siro; and Seino, Shuichi, to Honda Giken Kogyo Kabushiki Kaisha. Method of and apparatus for coating. 4,578,290, Cl. 427-421.000.

Komoto, Akira: *See*—
Shibahara, Yoshihumi; and Komoto, Akira, 4,577,709, Cl. 177-211.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Matsunawa, Masahiko, 4,578,712, Cl. 358-282.000.

Konkol, Werner: *See*—
Bahrmann, Helmut; Cornils, Boy; Konkol, Werner; and Lipps, Wolfgang, 4,578,523, Cl. 568-454.000.

Konno, Toshimitsu: *See*—
Kawata, Hiroitsu; Ohmura, Tadayoshi; Hasumi, Shunji; Konno, Yutaka; Aruga, Masayoshi; Tashiro, Seiki; Konno, Toshimitsu; and Iwai, Ken, 4,578,391, Cl. 514-256.000.

Konno, Yutaka: *See*—
Kawata, Hiroitsu; Ohmura, Tadayoshi; Hasumi, Shunji; Konno, Yutaka; Aruga, Masayoshi; Tashiro, Seiki; Konno, Toshimitsu; and Iwai, Ken, 4,578,391, Cl. 514-256.000.

Kopp, Robert W.: *See*—
Siemers, Paul A.; Kopp, Robert W.; Jackson, Melvin R.; Duke, Steven R.; Perrin, David P.; and Liu, Ying H., 4,577,431, Cl. 42-76.00A.

Koppa, Daniel A.; and Schaeder, Walter, to Nabisco Brands, Inc. Die having air passages. 4,578,027, Cl. 425-298.000.

Korbacher, Werner: *See*—
Richter, Ekkehard; Korbacher, Werner; Knoblauch, Karl; Giessler, Klaus; and Harder, Klaus-Burkhard, 4,578,089, Cl. 55-26.000.

Korenko, Michael K., to United States of America, Energy. Iron-nickel-chromium alloy having improved swelling resistance and low neutron absorbence. 4,578,130, Cl. 148-419.000.

Korody, Robert: *See*—
Faggin, Federico; Klein, Jerry A.; Yazolino, Lauren F.; Korody, Robert; Ha, Eric P. L.; and Kerman, Stephan, 4,578,537, Cl. 179-2.0DP.

Kosemura, Kinjiro; Yamashita, Yoshimi; Nakayama, Noriaki; and Yamamoto, Sumio, to Fujitsu Limited. Method for producing field effect type semiconductor device. 4,578,343, Cl. 430-296.000.

Kotobuki Seiyaku Company Limited: *See*—
Tomiyama, Tsuyoshi, 4,578,478, Cl. 548-193.000.

Kotz, Rainer: *See*—
Harder, Hans E.; Behrens, Klaus; and Kotz, Rainer, 4,578,081, Cl. 623-22.000.

Kouse, Charles H.: *See*—
Idzik, Joseph J.; and Kouse, Charles H., 4,577,406, Cl. 30-103.000.

Kraft, Douglas R.; and Elrod, Harry F., to Motorola, Inc. Asynchronous memory refresh arbitration circuit. 4,578,782, Cl. 365-222.000.

Kraftanlagen AG: *See*—
Frauenfeld, Martin; and von Wedel, Rudiger, 4,577,678, Cl. 165-10.000.

Kraftwerk Union Aktiengesellschaft: *See*—
Assmann, Helmut; Dichtjar, Gerhard; Dorr, Wolfgang; Maier, Georg; Mathieu, Viktor; and Peehs, Martin, 4,578,229, Cl. 264-0.500.
Forner, Siegfried; Langhammer, Karl-Heinz; Pellkofer, Dieter; and Nahr, Wolfgang, 4,577,795, Cl. 228-29.000.
Jestrich, Hans-Achim; and Friedrich, Paul, 4,577,505, Cl. 73-629.000.
Jestrich, Hans-Achim; and Wernigen, Ewald, 4,577,507, Cl. 73-640.000.
Steinke, Alexander, 4,578,239, Cl. 376-441.000.
Weghaupt, Erich; Intichar, Lutz; and Schnapper, Christoph, 4,577,871, Cl. 277-8.000.

Kramer, James H., to B. F. Goodrich Company, The. Bearing assembly and method for assembling a bearing. 4,577,379, Cl. 29-149.50S.

Kramer, Timothy A.; Young, Gerald A.; and Kock, Ronald W., to Procter & Gamble Company, The. Absorbent laminate structure. 4,578,068, Cl. 604-368.000.

Krapcho, John; and Wade, Peter C., to E. R. Squibb & Sons, Inc. Imido, amido and amino derivatives of mercaptoacyl prolines and pipecolic acids. 4,578,474, Cl. 546-188.000.

Krasinski, Jerzy S.; Heller, Donald F.; and Kafri, Oded, to Allied Corporation. Moire microscope. 4,577,940, Cl. 350-502.000.

Kray, William D., to General Electric Company. Photopatternable polyimide compositions and method for making. 4,578,328, Cl. 430-18.000.

Kreamer, Jeffry W. Aneurysm repair apparatus and method. 4,577,631, Cl. 128-334.00R.

Kreeger, Elsmer W., to Pinckney Molded Plastics, Inc. Three-level stacking container. 4,577,759, Cl. 206-505.000.

Kresin, Hermann, to Gizeh-Werk GmbH. Cup-shaped container. 4,577,775, Cl. 220-66.000.

Kretzschmar, Klaus: *See*—
Kleeberg, Wolfgang; Hauschildt, Klaus-Robert; Hacker, Heinz; and Kretzschmar, Klaus, 4,578,452, Cl. 528-297.000.

Kring, Charles J., to Wafab, Inc. Chemical bath apparatus and support assembly. 4,578,137, Cl. 156-345.000.

Krishnan, Sivaram; Grigo, Ulrich R.; and Folajtar, Donald A., to Mobay Chemical Corporation. Flame retarding silanes. 4,578,409, Cl. 524-94.000.

Krizmanic, Jacky, to Societe de Signalisations Automobiles S.E.I.M.A. Headlamp with adjustable reflector for motor vehicles. 4,578,740, Cl. 362-66.000.

Krubert, George J., to Keebler Company. Printing of foods. 4,578,273, Cl. 426-87.000.

Krueger, Achim R., to Du Pont de Nemours, E. I., and Company. Two-package urethane maintenance primer. 4,578,418, Cl. 524-400.000.

Kruger, Uwe: *See*—
Keller, Heimo; Keppler, Bernhard; Kruger, Uwe; and Linder, Rudolf, 4,578,401, Cl. 514-49.000.

Krum, Richard G.: *See*—
Bingaman, Barrett P.; Krum, Richard G.; and Williams, James R., 4,577,790, Cl. 226-118.000.

Krupp Industrietechnik Werk Buckau-Wolf: *See*—
Bruckner, Harald, 4,578,525, Cl. 568-918.000.

Kubodera, Noboru: *See*—
Nagano, Hiroyuki; Takagi, Mitiro; Kubodera, Noboru; Matsunaga, Isao; Nabata, Hiroyuki; Ohba, Yasuhiro; Sakai, Kazushige; Hata, Shun-ichi; and Uchida, Yasumi, 4,578,465, Cl. 544-225.000.

Kubota, Shigeo, to Sony Corporation. Optical apparatus. 4,577,941, Cl. 350-582.000.

Kubota, Tadatoshi: *See*—
Hamashima, Yoshio; Ishikura, Koji; Kubota, Tadatoshi; and Minami, Kyoji, 4,578,378, Cl. 514-210.000.

Kubozuka, Takao: *See*—
Hayashi, Yoshimasa; Kubozuka, Takao; and Hirano, Yoshinori, 4,577,594, Cl. 123-41.080.

Kucharski, Paul G.: *See*—
Pascucci, Gregory A.; and Kucharski, Paul G., 4,578,538, Cl. 179-2.0DP.

Kuchenbecker, Morris W., to James River Corporation of Virginia. Reclosable package and carton blank and process for making the same. 4,577,762, Cl. 206-612.000.

Kuchheuser, Werner: *See*—
Meller, Theo; Knecht, Heinz; and Kuchheuser, Werner, 4,577,840, Cl. 267-64.170.

Kudo, Yoshihiko; and Yoshida, Eiji, to Kureha Chemical Industry Co., Ltd. Process for removing sulfur dioxide from off-gas. 4,578,257, Cl. 423-243.000.

Kukes, Simon G.; Johnson, Marvin M.; Strope, Daniel J.; and Hogan, Robert J., to Phillips Petroleum Company. Hydrofining process for hydrocarbon containing feed streams. 4,578,179, Cl. 208-110.000.

Kukes, Simon G.; Hogan, Robert J.; Coombs, Daniel M.; and Strope, Daniel J., to Phillips Petroleum Company. Hydrofining process for hydrocarbon containing feed streams. 4,578,180, Cl. 208-110.000.

Kumagi, Teruo: *See*—
Mori, Toshikatsu; Takeuchi, Seizi; Matsuda, Shimpei; Kumagi, Teruo; Kato, Akira; Yamashita, Hisao; and Takeuchi, Masato, 4,578,112, Cl. 75-108.000.

Kundinger, Josef; Hohmann, Claus; and Muhleck, Martin, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung.

Fiber compound structural component and method for making such a component. 4,578,303, Cl. 428-116.000.

Kunii, Haruo: *See—*
Shigemori, Daizo; Kunii, Haruo; and Endo, Masaaki, 4,578,733, Cl. 361-120.000.

Kuno, Toshitaka; and Kamiya, Atsushi, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Method for measuring driving amount of motor and apparatus therefor. 4,578,749, Cl. 364-167.000.

Kunter, Richard S.; and Turney, John R., to Homestake Mining Company. Gold recovery process. 4,578,163, Cl. 204-110.000.

Kureha Chemical Industry Co., Ltd: *See—*
Kudo, Yoshihiko; and Yoshida, Eiji, 4,578,257, Cl. 423-243.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Ouchi, Isao; and Yusa, Hideo, 4,578,294, Cl. 428-35.000.
Sakagami, Teruo; Fujii, Yasufumi; and Murayama, Naohiro, 4,578,445, Cl. 526-292.300.
Takita, Hitoshi; Noda, Sakuo; Mukaida, Yutaka; and Kobayashi, Hidetoshi, 4,578,404, Cl. 514-567.000.

Kuribayashi, Kiyoshi: *See—*
Nakano, Akihiko; Matsumoto, Hitoshi; Uda, Hiroshi; Komatsu, Yasumasa; Kuribayashi, Kiyoshi; and Ikegami, Seiji, 4,578,526, Cl. 136-251.000.

Kuriyama, Takashi: *See—*
Takanashi, Itsuo; Nakagaki, Shintaro; Miyazaki, Kenichi; and Kuriyama, Takashi, 4,578,699, Cl. 358-44.000.

Kurokawa, Junji: *See—*
Ikeda, Itsuo; Kurokawa, Junji; Hasebe, Mitsuo; Miyagawa, Seiichi; and Hariu, Hajime, 4,578,331, Cl. 430-42.000.

Kuroyama, Yutaka; and Araki, Masatada, to Nippon Oil and Fats Company Limited. Method for purifying diamond. 4,578,260, Cl. 423-446.000.

Kurozumi, Seizi: *See—*
Noyori, Ryoji; Suzuki, Masaaki; Yanagisawa, Akira; and Kurozumi, Seizi, 4,578,482, Cl. 549-214.000.

Kuss, Peter: *See—*
Bachmann, Bernd; Kuss, Peter; Schuhmann, Frank; and Wollner, Jurgen, 4,577,854, Cl. 271-227.000.

Kuwamoto, Hiroshi: *See—*
Kizaki, Kanji; Ishii, Hajime; Taguchi, Noboru; and Kuwamoto, Hiroshi, 4,577,480, Cl. 72-8.000.

Kuznicki, William J.: *See—*
Mooney, Charles W.; Phipps, Robert E.; and Kuznicki, William J., 4,577,735, Cl. 188-268.000.

Kuzuya, Susumu: *See—*
Yamamoto, Takemi; Kuzuya, Susumu; Kagami, Isao; and Takenaka, Yuuichi, 4,577,984, Cl. 400-625.000.

Kwok, King H.: *See—*
Drucker, Alan S.; and Kwok, King H., 4,577,828, Cl. 248-678.000.

Kyorin Pharmaceutical Co., Ltd.: *See—*
Irikura, Tsutomu; Nishino, Keigo; Suzue, Seigo; and Ikeda, Toshiya, 4,578,392, Cl. 514-300.000.

Kyushu University: *See—*
Hayashi, Masanori; Sakurai, Akira; and Aso, Shigeru, 4,577,976, Cl. 374-29.000.

L. P. Weidemann & Sonner: *See—*
Weidemann, Jorn U., 4,577,553, Cl. 100-4.000.

La Jolla Cancer Research Foundation: *See—*
Ruoslahti, Erkki; and Pierschbacher, Michael, 4,578,079, Cl. 623-11.000.

Labeda, David P.: *See—*
Carter, Guy T.; Borders, Donald B.; Goodman, Joseph J.; and Labeda, David P., 4,578,468, Cl. 546-35.000.

Labeeuw, Bernard; and Salhi, Ali, to Sanofi. Derivatives of cephalosporins, their process of separation and antibiotic drugs containing the said derivatives. 4,578,377, Cl. 514-206.000.

Labtest Equipment Co. (S.E. Asia) Pty. Ltd.: *See—*
Knight, Trevor V., 4,577,517, Cl. 73-864.810.

Laclede Professional Products, Inc.: *See—*
Pellico, Michael A.; and Montgomery, Robert E., 4,578,265, Cl. 424-50.000.

Lacoste, SA: *See—*
Roy, Jehan; and Dubois, Jean, 4,577,878, Cl. 280-242.0WC.

Lacour, Clement-Francois; and Janer, Patrick, to Thomson-CSF. Microwave microstrip filter with U-shaped linear resonators having centrally located capacitors coupled to ground. 4,578,656, Cl. 333-204.000.

Laing, Stuart B.: *See—*
Phillipps, Gordon H.; Bain, Brian M.; and Laing, Stuart B., 4,578,221, Cl. 260-397.100.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See—*
Faudou, Jean-Yves; and Pelloux-Gervais, Pierre, 4,577,386, Cl. 29-455.00R.

Lambe, Christopher A.: *See—*
Rosevear, Alan; and Lambe, Christopher A., 4,578,351, Cl. 435-41.000.

Lambeg Industrial Research Association: *See—*
Currie, Brian; Gardiner, Thomas; and Green, Henry M., 4,578,301, Cl. 428-109.000.

Lambert, Allan H.; Keating, Esmond J.; and Verburg, Gerald B., to United States of America, Agriculture. Low wet pickup fabric finishing apparatus. 4,577,476, Cl. 68-5.00D.

Lambertz, Johannes: *See—*
Adlhoch, Wolfgang H.; and Lambertz, Johannes, 4,578,226, Cl. 261-71.000.

Lancaster, Eugene P., to Weyerhaeuser Company. Leak resistant diaper or incontinent garment. 4,578,072, Cl. 604-385.00A.

Landey, Michael: *See—*
Hatfield, Raymond W., 4,578,310, Cl. 428-334.000.

Lane, Ramon: *See—*
Aviram, Ari; Dove, Derek B.; and Lane, Ramon, 4,577,983, Cl. 400-120.000.

Lang, Paul W.; and Gribshaw, Franklin C., to Jensen, Allen; and Goldstake, a part interest to each. Flat optical TV screen. 4,578,709, Cl. 358-230.000.

Langdon, Nick H.: *See—*
Mayer, John F.; Langdon, Nick H.; Cook, Stuart A.; Nicholson, L. Todd; and Belcher, John R., 4,578,045, Cl. 446-330.000.

Langen, Christianus P.; and Langen, Johannes C., to Langen Research B.V. De-boning machine. 4,577,369, Cl. 17-46.000.

Langen, Johannes C.: *See—*
Langen, Christianus P.; and Langen, Johannes C., 4,577,369, Cl. 17-46.000.

Langen Research B.V.: *See—*
Langen, Christianus P.; and Langen, Johannes C., 4,577,369, Cl. 17-46.000.

Langhammer, Karl-Heinz: *See—*
Forner, Siegfried; Langhammer, Karl-Heinz; Pellkofer, Dieter; and Nahr, Wolfgang, 4,577,795, Cl. 228-29.000.

Langlois, Patrice R.: *See—*
Colin de Verdiere, Jean-Marc M.; and Langlois, Patrice R., 4,578,544, Cl. 179-170.200.

Lankford, Frank L., Jr.: *See—*
Lin, Chew-Chen; and Lankford, Frank L., Jr., 4,578,578, Cl. 250-252.100.

Lanmon, C. P., II, to Hydrolex, Inc. Cable head catcher mechanism. 4,577,687, Cl. 166-243.000.

Lannom, James W.: *See—*
Genovese, Frank C.; and Lannom, James W., 4,578,615, Cl. 313-497.000.

Lanson Electronics, Inc.: *See—*
Gionet, Daniel C.; and Nguyen, Harry V., 4,577,437, Cl. 49-25.000.

Lare, Donald W.; and Van Nguyen, Thanh, to Avery International Corporation. Web coating method and apparatus. 4,578,288, Cl. 427-365.000.

Large, David T., to Boeing Company, The. Waterproof floor panel fastening system, accessible from above. 4,577,450, Cl. 52-787.000.

Larken, John M.; and Vanderpool, Steven H., to Texaco Inc. (Parent). Catalytic synthesis of linear polyethylenepolyamines (polyethylenepolyamine preparation and catalyst). 4,578,519, Cl. 564-479.000.

Larrabee, Edward W.: *See—*
Huck, Charles M.; and Larrabee, Edward W., 4,578,060, Cl. 604-133.000.

Larson, Lawrence L.: *See—*
Ruger, William B.; and Larson, Lawrence L., 4,577,430, Cl. 42-69.00R.

Larter, Stephen R., to Union Oil Company of California. Field source rock evaluation method. 4,578,356, Cl. 436-31.000.

Laszlo, Hideg; and Koller, Paul L., to Ford Motor Company. Selective parametric self-calibrating control system. 4,578,747, Cl. 364-151.000.

Laufer, Helmut: *See—*
Bohringer, Wilfried; Eheim, Franz, deceased; Fehlmann, Wolfgang; Laufer, Helmut; and Zibold, Karl, 4,577,606, Cl. 123-506.000.

Laughton, William J., to General Electric Company. Intergratable load voltage sampling circuit for R.M.S. load average voltage control apparatus. 4,578,632, Cl. 323-315.000.

Laurent, Gunter: *See—*
Reinartz, Dieter; Bender, Heinrich; and Laurent, Gunter, 4,578,194, Cl. 210-673.000.

Lawson, Leslie E.; and Ingham, Michael, to Vickers PLC. Method and apparatus for controlling the processing of radiation sensitive plates with a liquid by monitoring the electrical conductivity of the liquid. 4,577,948, Cl. 354-299.000.

Laxton, Raymond: *See—*
Roberts, Lyn M.; Shrier, Robert L.; and Laxton, Raymond, 4,578,700, Cl. 358-84.000.

Learner, Eugene L., to DAP Inc. Aqueous aerosol coating composition. 4,578,415, Cl. 524-322.000.

Lebesnerais, Gerard M.: *See—*
Delaporte, Francois Xavier; Lebesnerais, Gerard M.; and Pantani, Jean-Pierre, 4,57[illegible]95, Cl. 357-48.000.

Le Bourlot, Jean; and Levy, Michel, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Digital echo canceller. 4,578,543, Cl. 179-170.200.

Lechot, Andre ; and Louis, Alexandre, to LNS, S.A. Feed apparatus for automatic lathes. 4,577,536, Cl. 82-2.700.

Lectron Products, Inc.: *See—*
Slavin, Michael; and Miller, Ellsworth S., 4,578,662, Cl. 335-262.000.

Lee, Chang-Kuei: *See—*
Chou, Tai-Sheng; and Lee, Chang-Kuei, 4,578,183, Cl. 208-113.000.

Lee, Chune: *See—*
Sliwa, John W.; Burt, Roy J.; Lee, Chune; MacKay, John; and Johnson, Cindy A., 4,577,398, Cl. 29-590.000.

Lee, Hsiao-Peng S.: *See—*
Amdahl, Gene M.; Lee, Hsiao-Peng S.; Rawlinson, Stephen J.; and Stuart, Stephen F., 4,578,750, Cl. 364-200.000.

Lee, John T. M., to ICI Americas Inc. Ultrafast thermal actuator. 4,577,544, Cl. 89-1.140.

Lee, Thomas D., to USV Pharmaceutical Corp. 7,8-Dihydroimidazo[1,5-a]pyrazin-8-ones. 4,578,386, Cl. 514-241.000.

Leggett & Platt, Incorporated: *See*—
Crum, Michael A., 4,577,902, Cl. 297-85.000.

Lehnert, Klaus: *See*—
Geyken, Erwin; Heckl, Franz; Kastl, Alfons; Lehnert, Klaus; and Loistl, Rudolf, 4,577,949, Cl. 354-319.000.

Lehto, Eino; Moller, Goran; and Sjovall, Lasse. Irrigation pipe. 4,577,997, Cl. 405-43.000.

Leighton, Estelle. Method of instructions for knitting and crocheting. 4,578,036, Cl. 434-95.000.

Leinhaas, Werner. Gripper feed advance mechanism for a press or the like. 4,577,791, Cl. 226-142.000.

Leipold, Ludwig: *See*—
Tihanyi, Jeno ; Fellinger, Christine; and Leipold, Ludwig, 4,578,595, Cl. 307-252.00R.
Tihanyi, Jenoe ; Fellinger, Christine; and Leipold, Ludwig, 4,578,596, Cl. 307-252.00R.

Leland Stanford Junior University, The Board of Trustees of the: *See*—
Kane, Thomas J.; and Byer, Robert L., 4,578,793, Cl. 372-94.000.

Leman, Marvin G.: *See*—
Dirksing, William P.; Leman, Marvin G.; and Van Coney, Robert H., 4,578,028, Cl. 425-525.000.

Lemelson, Jerome H. Injection catheter and method. 4,578,061, Cl. 604-164.000.

Lemelson, Jerome H. Magnetic record card transducing apparatus and method. 4,578,717, Cl. 360-2.000.

Lemforder Metallwaren AG: *See*—
Buhl, Reihard; and Westphal, Paul, 4,577,987, Cl. 403-133.000.

Lenard, Peter; Pokorny, Erich; and Bailer, Norbert, to Vollmer Werke Maschinenfabrik GmbH. Adjusting mechanism for a grinding wheel on a sharpening machine for saws. 4,577,533, Cl. 76-41.000.

Lenhart, John W., to Lenkin Ltd. Short flight golf ball and game. 4,577,867, Cl. 273-176.0AB.

Lenkin Ltd.: *See*—
Lenhart, John W., 4,577,867, Cl. 273-176.0AB.

Lenten, Hendrik. Elongated propelling means for manually moving a sailing craft over the water surface. 4,578,038, Cl. 440-19.000.

Lenz, Helmut: *See*—
Siedel, Joachim; Neumann, Ulrich; Ziegenhorn, Joachim; Batz, Hans-Georg; Lenz, Helmut; Pautz, Brigitte; and Albert, Winfried, 4,578,361, Cl. 436-547.000.

Lenz, Werner; Sander, Hans; and Moeller, Dieter, to BASF Aktiengesellschaft. Production of coatings. 4,578,426, Cl. 525-131.000.

Leone-Bay, Andrea; and Timony, Peter E., to Stauffer Chemical Company. Herbicidal esters of 2-bromo-4-methylimidazole-5-carboxylic acid. 4,578,106, Cl. 71-92.000.

Letemps, Bernard: *See*—
Colmon, Daniel; and Letemps, Bernard, 4,578,102, Cl. 65-114.000.

Lever Brothers Company: *See*—
Walker, Adrian W., 4,578,206, Cl. 252-95.000.

Levy, Michel: *See*—
Le Bourlot, Jean; and Levy, Michel, 4,578,543, Cl. 179-170.200.

Lewis, Bernard L., to United States of America, Navy. Range doppler coupling magnifier. 4,578,677, Cl. 343-17.2PC.

Lier, Pierre: *See*—
Greenwald, Harry; and Lier, Pierre, 4,578,548, Cl. 200-38.00F.

Life Key Corporation: *See*—
Foster, Dwight R.; and Foster, Diane, 4,577,425, Cl. 40-19.000.

Light, Ronald R.; and Seymour, Robert W., to Eastman Kodak Company. Copolyester/polyester blends having reduced carbon dioxide permeability. 4,578,437, Cl. 525-444.000.

Lii, Huei J. Snap hook and buckle. 4,577,374, Cl. 24-165.000.

Lillo, Arnold D. Wood burning furnace. 4,577,616, Cl. 126-110.00R.

Lin, Chester H., to S&C Electric Company. Operating mechanism for electrical switches. 4,578,551, Cl. 200-153.0SC.

Lin, Chew-Chen; and Lankford, Frank L., Jr., to Texaco Inc. Method for correcting spectrum shift. 4,578,578, Cl. 250-252.100.

Lindahl, Jonas A. I.; and Johnsson, Gustaf E., to Mo och Domsjo Aktiebolag. Process for manufacturing groundwood pulp while maintaining a high and uniform moisture content in the wood in the grinding zone. 4,578,147, Cl. 162-26.000.

Lindahl, Jonas A. I., to Mo och Domsjo Aktiebolag. Process for manufacturing bright and strong bleached groundwood pulp of uniform quality. 4,578,148, Cl. 162-26.000.

Lindberg, Ronald O. J.: *See*—
Arp, Bradley W.; Lindberg, Ronald O. J.; and Mueller, Wayne A., 4,578,569, Cl. 235-454.000.

Linder, Rudolf: *See*—
Keller, Heimo; Keppler, Bernhard; Kruger, Uwe; and Linder, Rudolf, 4,578,401, Cl. 514-49.000.

Lindorfer, Walter; Jahn-Held, Wilhelm; Gerschler, Lutz J.; Jandel, Berthold; and Wartenpfuhl, Friedel, to Wintershall AG. Process for storing liquid waste in salt cavities. 4,577,999, Cl. 405-53.000.

Lindqvist, Gustav; and Juurmaa, Kimmo, to Oy Wartsila Ab. Method of protection. 4,578,000, Cl. 405-211.000.

Lindstrom, Lars; and Nilsson, Kent, to ASEA AB. Method and control system for controlling an industrial robot. 4,578,562, Cl. 219-125.100.

Link Electronics Limited: *See*—
Munnion, Derek, 4,578,708, Cl. 358-229.000.

Linscheid, Denver D., to FMC Corporation. Electrical insulating and sealing apparatus and process for using same. 4,578,088, Cl. 55-2.000.

Lipps, Wolfgang: *See*—
Bahrmann, Helmut; Cornils, Boy; Konkol, Werner; and Lipps, Wolfgang, 4,578,523, Cl. 568-454.000.

Litton Systems, Inc.: *See*—
Ross, William E.; and MacNeal, Bruce E., 4,578,321, Cl. 428-693.000.

Liu, Ying H.: *See*—
Siemers, Paul A.; Kopp, Robert W.; Jackson, Melvin R.; Duke, Steven R.; Perrin, David P.; and Liu, Ying H., 4,577,431, Cl. 42-76.00A.

Liu, Yung-Ho. Electrical safety iron. 4,577,424, Cl. 38-88.000.

Liukkonen, Ahti M. K.: *See*—
Luukkainen, Tapani; and Liukkonen, Ahti M. K., 4,578,076, Cl. 604-892.000.

LNS, S.A.: *See*—
Lechot, Andre ; and Louis, Alexandre, 4,577,536, Cl. 82-2.700.

Lobley, Derek G., to Multifibre Process Limited. Method to reduce the potential salt cake content of chlorine dioxide generator spent acids. 4,578,261, Cl. 423-478.000.

Lochte, Glen E.: *See*—
Milberger, Lionel J.; Lochte, Glen E.; and Masciopinto, Anthony J., 4,577,686, Cl. 166-208.000.

Lockheed Missiles & Space Company, Inc.: *See*—
Sanders, Thomas C.; and Calvert, Wynne, 4,578,663, Cl. 335-306.000.

Lohati, Aladar; and Lohati, Gizella. Rotating ball massager. 4,577,625, Cl. 128-57.000.

Lohati, Gizella: *See*—
Lohati, Aladar; and Lohati, Gizella, 4,577,625, Cl. 128-57.000.

Lois G. Langley: *See*—
Eliscu, Joshua, 4,577,827, Cl. 248-656.000.

Loistl, Rudolf: *See*—
Geyken, Erwin; Heckl, Franz; Kastl, Alfons; Lehnert, Klaus; and Loistl, Rudolf, 4,577,949, Cl. 354-319.000.

Look, Raymond J., to AMP Incorporated. Flat peelable cable. 4,578,529, Cl. 174-117.0FF.

Loos, Rolf: *See*—
Heitmann, Jurgen; Loos, Rolf; and Wagner, Peter, 4,578,719, Cl. 360-31.000.

Lordi, Peter F.: *See*—
Marcus, David L.; and Lordi, Peter F., 4,578,119, Cl. 134-4.000.

Louis, Alexandre: *See*—
Lechot, Andre ; and Louis, Alexandre, 4,577,536, Cl. 82-2.700.

Lovgren, Jeffrey L.; and Plummer, William B., to International Business Machines Corporation. Method for checking disk identity in a flexible disk recorder. 4,578,722, Cl. 360-60.000.

Lowenheck, Konrad, to N. Zivy & Cie, S.A. Thread-tension meter. 4,577,512, Cl. 73-862.450.

Lucas, Gary M.: *See*—
Pratt, Sandra L.; Lucas, Gary M.; and Zembayashi, Michio, 4,578,492, Cl. 556-407.000.

Ludwig, Christian: *See*—
Grosser, Siegfried; Ludwig, Christian; Wallner, Kurt; Herzog, Karl; and Bayerl, Eugen, 4,577,944, Cl. 352-35.000.

Ludwig Neumann & Co. GmbH: *See*—
Schickaneder, Helmut; Szeleny, Istvan; Morsdorf, Peter; and Ahrens, Kurt H., 4,578,389, Cl. 514-254.000.

Lue, Paul D.: *See*—
Charalambous, Salomi T.; Horvath, Mark P.; House, Cathy P.; Iapicco, Jeffrey A.; Lue, Paul D.; and Verma, Shiv P., 4,578,796, Cl. 375-8.000.

Luk Lamellen und Kupplungsbau GmbH: *See*—
Schmid, Christoph, 4,577,741, Cl. 192-85.00V.

Luke, John A., to British-American Tobacco Company Limited. Tobacco-smoke filters. 4,578,053, Cl. 493-45.000.

Lundin, Nils: *See*—
Borrman, Bo; Hellman, Erik; Lundin, Nils; and Ode, Bengt, 4,578,241, Cl. 376-446.000.

Lusk, Donald I., to A. O. Smith Corporation. Composite structures and a method for improving the service life thereof. 4,578,293, Cl. 428-35.000.

Lutz, Robert G.: *See*—
Gergen, William P.; Lutz, Robert G.; and Gelles, Richard, 4,578,429, Cl. 525-291.000.

Luukkainen, Tapani; and Liukkonen, Ahti M. K., to Population Council, Inc., The. Medicated intracervical and intrauterine devices. 4,578,076, Cl. 604-892.000.

M.A.N.-Roland Druckmaschinen Aktiengesellschaft: *See*—
Burger, Rainer, 4,577,559, Cl. 101-221.000.
Fischer, Hermann, 4,577,556, Cl. 101-148.000.
Fischer, Hermann, 4,577,557, Cl. 101-217.000.
Fischer, Hermann, 4,577,558, Cl. 101-365.000.

M. S. Willett, Inc.: *See*—
Boegner, Gregory J.; Walters, Harry J.; and Marshner, Robert L., 4,577,748, Cl. 198-621.000.

Ma, Thomas T., to Ford Motor Company. Internal combustion engine and cam drive mechanism therefor. 4,577,598, Cl. 123-90.180.

Maastricht, Charles: *See*—
Klabunde, Steven E.; Hankwitz, Edward H.; and Maastricht, Charles, 4,577,535, Cl. 82-2.00E.

Mabboux, Michel: *See*—
Petrini, Roland; Pradier, Serge; and Mabboux, Michel, 4,577,420, Cl. 36-117.000.

Mabelis, Richard P., to Imperial Chemical Industries Plc. Gibberellin amine salts. 4,578,483, Cl. 549-297.000.

Macangus, Alexander; and Dickson, Thomas. Skydiving simulator. 4,578,037, Cl. 434-258.000.

Macchio, Ralph A.: *See—*
Tietjen, Marlene; Brown, Ivonne; and Macchio, Ralph A., 4,578,266, Cl. 424-63.000.

MacDonald, John F.: *See—*
McKee, John M.; and MacDonald, John F., 4,578,739, Cl. 361-395.000.

MacFarlane, James W.; and Smyth, Bruce E., to Itek Corporation. System for printed circuit board defect detection. 4,578,810, Cl. 382-8.000.

Macho, Heinz: *See—*
van Rijckevorsel, Rainer; Kasielke, Joachim; Macho, Heinz; Schafer, Peter; and Nenninger, Klaus, 4,578,716, Cl. 360-1.000.

MacKay, John: *See—*
Sliwa, John W.; Burt, Roy J.; Lee, Chune; MacKay, John; and Johnson, Cindy A., 4,577,398, Cl. 29-590.000.

Mackson, Richard G. Computer controlled replenishing system for automatic film processor. 4,577,950, Cl. 354-324.000.

MacLeod Laboratories, Inc.: *See—*
MacLeod, Norman C., 4,578,675, Cl. 340-855.000.

MacLeod, Norman C., to MacLeod Laboratories, Inc. Apparatus and method for logging wells while drilling. 4,578,675, Cl. 340-855.000.

MacNeal, Bruce E.: *See—*
Ross, William E.; and MacNeal, Bruce E., 4,578,321, Cl. 428-693.000.

Macon, Fred M.: *See—*
Freeman, John P.; Macon, Fred M.; and Mee, John D., 4,578,348, Cl. 430-607.000.

Macovski, Albert. Energy-selective x-ray recording and readout system. 4,578,803, Cl. 378-62.000.

Maeda, Tatsumi: *See—*
Ito, Takeo; Ido, Tadashi; Takeuchi, Hajime; Hashimoto, Minoru; Maeda, Tatsumi; and Awa, Masashi, 4,578,313, Cl. 428-403.000.

Maehara, Kenso: *See—*
Ishii, Koji; and Maehara, Kenso, 4,577,555, Cl. 101-76.000.

Magee, Terence E., to ITT Industries, Inc. CMOS buffer circuit. 4,578,600, Cl. 307-451.000.

Mahulikar, Deepak; and Shapiro, Eugene, to Olin Corporation. Copper-nickel alloys for brazed articles. 4,578,320, Cl. 428-674.000.

Maier, Georg: *See—*
Assmann, Helmut; Dichtjar, Gerhard; Dorr, Wolfgang; Maier, Georg; Mathieu, Viktor; and Peehs, Martin, 4,578,229, Cl. 264-0.500.

Maier, Wilfried: *See—*
Wrulich, Herwig; Schoffmann, Franz; and Maier, Wilfried, 4,577,892, Cl. 285-136.000.

Maio, Kenji; and Moritani, Atsushi, to Hitachi, Ltd; and Hitachi Medical Corporation. Integral-type small signal input circuit. 4,578,646, Cl. 328-128.000.

Makino, Hiroshi: *See—*
Iwata, Hiroshi; and Makino, Hiroshi, 4,578,783, Cl. 367-99.000.

Makosch, Gunter, to International Business Machines Corporation. Method and arrangement for optical distance measurement. 4,577,968, Cl. 356-356.000.

Malesci S.p.A. Instituto Farmacobiologico: *See—*
Bonacchi, Graziano; Fedi, Mauro; and Giannini, Mario, 4,578,467, Cl. 544-360.000.

Malik, Robert J.: *See—*
Veillette, Norman T.; and Malik, Robert J., 4,578,690, Cl. 346-212.000.

Malito, John T.: *See—*
Roe, William J.; and Malito, John T., 4,578,255, Cl. 423-130.000.

Malmstrom, Rolf, to RM Metal Consulting Ky. Process for the refining of sulfidic concentrates which contain arsenic, antimony and bismuth. 4,578,254, Cl. 423-88.000.

Mann, William F.: *See—*
Gilda, Patricia; Mann, William F.; and Allen, Winthrop D., III, 4,577,758, Cl. 206-496.000.

Mannesmann Demag Wean: *See—*
Rehag, Klaus; and Gerretz, Jc f, 4,577,483, Cl. 72-214.000.

Manzoni, Stephane. Device for remotely controlling a rearview mirror. 4,577,823, Cl. 248-487.000.

March, Carl J.: *See—*
Urdal, David L.; March, Carl J.; and Dower, Steven K., 4,578,335, Cl. 435-68.000.

Marcus, David L.; and Lordi, Peter F. Method for clean-up of blood spills. 4,578,119, Cl. 134-4.000.

Marhal, Joseph. Sealed message carrier. 4,577,753, Cl. 206-232.000.

Marinelli, Charles P.: *See—*
Dewey, Anthony G.; and Marinelli, Charles P., 4,577,926, Cl. 350-96.250.

Markiewicz, Jan: *See—*
Mordarski, Walter J.; and Markiewicz, Jan, 4,578,237, Cl. 376-154.000.

Marko, Ollie W.; Steinmeyer, Robert D.; and Rentsch, Stefan, to Dow Corning Corporation. Preparation of polysiloxanes from halosilanes. 4,578,494, Cl. 556-452.000.

Markwell, Roger E.; and Smith, Stephen A., to Beecham Group p.l.c. Dihydroisoquinoline derivatives. 4,578,393, Cl. 514-310.000.

Markwitz, Wernhard, to Siemens Aktiengesellschaft. Method and apparatus for code transmission. 4,578,532, Cl. 178-22.130.

Maroone, James P.: *See—*
Fisher, Robert W.; Maroone, James P.; Tipping, Donald W.; and Zanner, Frank J., 4,578,795, Cl. 373-70.000.

Maroti, Steven; and Formosa, Daniel, to Hickory Industries, Inc. Toaster. 4,577,550, Cl. 99-329.0RT.

Marshall, Peter E. G.; Piper, Francis R.; and Wilson, John F., to BL Technology Limited. Detecting leaks. 4,577,489, Cl. 73-40.700.

Marshall, Peter E. G.: *See—*
Bray, David J.; Johnson, Peter E.; Marshall, Peter E. G.; Piper, Francis R.; and Murdoch, Iain H., 4,577,490, Cl. 73-40.700.

Marshner, Robert L.: *See—*
Roegner, Gregory J.; Walters, Harry J.; and Marshner, Robert L., 4,577,748, Cl. 198-621.000.

Marson Corporation: *See—*
Racca, Richard F.; Swier, Willem; and Di Maio, Anthony E., 4,577,783, Cl. 222-386.500.

Martin, Donald E., to Rexnord Inc. Conveyor roller and bearing assembly. 4,577,747, Cl. 198-500.000.

Martin, Merrill D. Wheel for measuring horizontal traveling strip. 4,577,411, Cl. 33-141.00E.

Martinez, Francisco P. Tearable bottle caps. 4,577,771, Cl. 215-256.000.

Martinez, Miguel, to CooperVision, Inc. Surgical cutting instrument for ophthalmic surgery. 4,577,629, Cl. 128-305.000.

Marty, Garry R., to Masco Corporation. Anti-siphon and anti-knock diverter valve. 4,577,653, Cl. 137-119.000.

Marukawa, Toshio; Nakao, Haruki; and Mikiya, Toshio, to Nikki Co., Ltd. Massager. 4,577,626, Cl. 128-64.000.

Maruyama, Iwao: *See—*
Ebisawa, Hiroo; Maruyama, Iwao; Fukuda, Masao; and Miyamoto, Shigeo, 4,578,281, Cl. 427-53.100.

Masciopinto, Anthony J.: *See—*
Milberger, Lionel J.; Lochte, Glen E.; and Masciopinto, Anthony J., 4,577,686, Cl. 166-208.000.

Masco Corporation: *See—*
Marty, Garry R., 4,577,653, Cl. 137-119.000.

Masco Corporation of Indiana: *See—*
Holycross, Frank R., Jr., 4,577,835, Cl. 251-310.000.

Mason, James H. Automotive wheel alignment gauge apparatus. 4,577,413, Cl. 33-203.180.

Masters Wilkerson Manufacturing Co. Ltd.: *See—*
Wilkerson, David T., 4,577,822, Cl. 248-463.000.

Masudaya Corporation Limited: *See—*
Saitoh, Shigeru, 4,578,044, Cl. 446-134.000.

Mathews, Harlan P.: *See—*
McIntosh, Robert; Mathews, Harlan P.; Rickert, David W.; Romano, Paul; and Walker, Jerry, 4,578,786, Cl. 369-44.000.

Mathiesen, Mait M., to Plasma Holdings, N.V. Treatment of pelletized iron ores. 4,577,838, Cl. 266-171.000.

Mathieu, Viktor: *See—*
Assmann, Helmut; Dichtjar, Gerhard; Dorr, Wolfgang; Maier, Georg; Mathieu, Viktor; and Peehs, Martin, 4,578,229, Cl. 264-0.500.

Mathis, Ronald F., to General Dynamics Electronics Division. Optical recursive filter. 4,577,924, Cl. 350-96.150.

Matias, Rene . Adjustable exercycle for providing simulated running exercises. 4,577,860, Cl. 272-73.000.

Matier, William L., to American Hospital Supply Corporation. Method for treating glaucoma by the topical administration of selectively metabolized beta-blocking agents. 4,578,403, Cl. 514-522.000.

Matsishita Electric Industrial Co.: *See—*
Tsukutani, Seiichi; and Nakada, Naoki, 4,578,623, Cl. 318-254.000.

Matsuda, Shimpei: *See—*
Mori, Toshikatsu; Takeuchi, Seizi; Matsuda, Shimpei; Kumagi, Teruo; Kato, Akira; Yamashita, Hisao; and Takeuchi, Masato, 4,578,112, Cl. 75-108.000.

Matsui, Yukio; and Uchiyama, Mitsuo, to Nissan Motor Co., Ltd. Method of electrolytically finishing spray-hole of fuel injection nozzle. 4,578,164, Cl. 204-129.550.

Matsumoto, Hitoshi: *See—*
Nakano, Akihiko; Matsumoto, Hitoshi; Uda, Hiroshi; Komatsu, Yasumasa; Kuribayashi, Kiyoshi; and Ikegami, Seiji, 4,578,526, Cl. 136-251.000.

Matsumoto, Isao: *See—*
Fuse, Genzo; Abe, Kaoru; and Matsumoto, Isao, 4,578,005, Cl. 409-140.000.

Matsumoto, Takeshi, to International Business Machines Corp. (IBM). Self-clocking code demodulator with error detecting capability. 4,578,720, Cl. 360-51.000.

Matsunaga, Isao: *See—*
Nagano, Hiroyuki; Takagi, Mitiro; Kubodera, Noboru; Matsunaga, Isao; Nabata, Hiroyuki; Ohba, Yasuhiro; Sakai, Kazushige; Hata, Shun-ichi; and Uchida, Yasumi, 4,578,465, Cl. 544-285.000.

Matsunawa, Masahiko, to Konishiroku Photo Industry Co., Ltd. Picture image discriminating apparatus. 4,578,712, Cl. 358-282.000.

Matsuno, Osamu: *See—*
Matsuoka, Masatoshi; Ikenaga, Yukio; and Matsuno, Osamu, 4,578,408, Cl. 524-91.000.

Matsuo, Yoshiaki: *See—*
Ando, Kazuo; and Matsuo, Yoshiaki, 4,578,025, Cl. 425-133.100.

Matsuoka, Hiroshi: *See—*
Takahashi, Yutaka; and Matsuoka, Hiroshi, 4,577,951, Cl. 354-331.000.

Matsuoka, Masatoshi; Ikenaga, Yukio; and Matsuno, Osamu, to Polyplastics Co., Ltd. Polyester resin composition resistant against discoloration by light. 4,578,408, Cl. 524-91.000.

Matsushima, Masaaki: *See—*
Sawamura, Mitsuharu; Ito, Susumu; Matsushima, Masaaki; Kishi, Hiroyoshi; Sasamori, Eizo; Yoshihara, Satoshi; Iijima, Shigeharu; and Takano, Katsuhiko, 4,578,322, Cl. 428-694.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Miki, Yutaka; Nozoe, Toshiro; and Uchimura, Kiyoshi, 4,578,698, Cl. 358-22.000.
Nakano, Akihiko; Matsumoto, Hitoshi; Uda, Hiroshi; Komatsu, Yasumasa; Kuribayashi, Kiyoshi; and Ikegami, Seiji, 4,578,526, Cl. 136-251.000.
Neki, Shigeo; Shinozaki, Nozomu; and Dohi, Takashi, 4,578,624, Cl. 318-305.000.
Sakakima, Hiroshi; Satomi, Mitsuo; Yanagiuchi, Yukihiro; and Senno, Harufumi, 4,578,728, Cl. 360-125.000.
Suzuki, Takashi; Fujimori, Hiroshi; and Odagiri, Masaru, 4,578,729, Cl. 360-134.000.
Yamashita, Hidekazu; and Kominami, Hideyuki, 4,578,553, Cl. 219-10.770.
Yoichi, Sakamoto, 4,578,706, Cl. 358-195.100.
Matsushita, Shigeru: *See—*
Harada, Shinichi; Ishihara, Yoshinobu; and Matsushita, Shigeru, 4,577,673, Cl. 164-448.000.
Harada, Shinichi; Toyoda, Hiroshi; Honma, Katsuhiko; and Matsushita, Shigeru, 4,577,674, Cl. 164-448.000.
Mattes, Hans G.: *See—*
Borg, Kevin E.; Halas, William P.; Mattes, Hans G.; McLear, Paul M.; and White, Lester L., 4,578,540, Cl. 179-2.00A.
Mautref, Michel; and Belouet, Christian, to Compagnie Generale d'Electricite; and Societe Nationale Elf Aquitaine. Device for process-type deposition of polycrystalline silicon on carbon film. 4,577,588, Cl. 118-665.000.
Maxwell Laboratories, Inc.: *See—*
Pearlman, Jay S.; and Shannon, John P., 4,578,805, Cl. 378-119.000.
May, Ronald W.: *See—*
White, James M.; May, Ronald W.; and Gulliver, Michael D., 4,578,711, Cl. 358-282.000.
Mayer, Edward F.; and Pfeuffer, Donald F., to Ricoh Company, Ltd. Electrophotographic copying apparatus including a guillotine cleaner blade arrangement and method of operation. 4,577,955, Cl. 355-15.000.
Mayer, John F.; Langdon, Nick H.; Cook, Stuart A.; Nicholson, L. Todd; and Belcher, John R., to CPG Products Corp. Action figure with leg movement derived from arm movement. 4,578,045, Cl. 446-330.000.
Mazac, Joe O. Lifting tool. 4,577,897, Cl. 294-15.000.
Mazda Motor Corporation: *See—*
Morita, Tetuya; Wakasa, Akinori; Ogawa, Yutaka; and Ogasawara, Takayuki, 4,577,600, Cl. 123-270.000.
Mazumder, Ali T.; and Dumas, Armand M., to NCR CANADA LTD.-NCR CANADA LTEE. Bar code processing apparatus. 4,578,570, Cl. 235-463.000.
Mazzoleni, Cyrille: *See—*
Bonino, Pierre; Ducret, Christian; and Mazzoleni, Cyrille, 4,577,893, Cl. 285-158.000.
McAlister, Doyle V.; and Crisp, Richard D., to Motorola, Inc. High speed TTL clock input buffer circuit which minimizes power and provides CMOS level translation. 4,578,601, Cl. 307-475.000.
McCarty, Frederick B., to Garrett Corporation, The. Permanent magnet dynamoelectric machine. 4,578,609, Cl. 310-156.000.
McClelland, Paul H.: *See—*
Cloutier, Frank L.; McClelland, Paul H.; Boucher, William R.; and Siewell, Gary L., 4,578,687, Cl. 346-140.00R.
McConnell, Christopher F. Vessel and system for treating wafers with fluids. 4,577,650, Cl. 134-59.000.
McCoy, David R.: *See—*
Yeakey, Ernest L.; Speranza, George P.; Triebel, Carol A.; and McCoy, David R., 4,578,205, Cl. 252-76.000.
McCrory, Carl E.; and Hall, Herbert G., to Carl McCrory Enterprises, Inc. Mixing and blending apparatus. 4,577,975, Cl. 366-314.000.
McIntire, Harold K.: *See—*
Weglage, David E., 4,577,382, Cl. 29-229.000.
McIntosh, Bruce D.: *See—*
Nusbaumer, Kay T.; and McIntosh, Bruce D., 4,577,898, Cl. 294-88.000.
McIntosh, Robert; Mathews, Harlan P.; Rickert, David W.; Romano, Paul; and Walker, Jerry, to Storage Technology Partners II. Track pitch calibration system for use in optical storage devices. 4,578,786, Cl. 369-44.000.
McIntyre, James A.; Phillips, Robert F.; and Oswald, Max R., to Dow Chemical Company, The. Method for dissolving copper in the presence of iron. 4,578,162, Cl. 204-107.000.
McKee, John M.; and MacDonald, John F., to Motorola, Inc. Quick disconnect and function change radio assembly. 4,578,739, Cl. 361-395.000.
McKee, Joseph M.; and Horton, Robert L., to Phillips Petroleum Company. Method for in situ shale oil recovery. 4,577,908, Cl. 299-2.000.
McKinney, Robert L., to Goodyear Tire & Rubber Company, The. Rheometer rotor height gauge. 4,577,412, Cl. 33-172.00R.
McLear, Paul M.: *See—*
Borg, Kevin E.; Halas, William P.; Mattes, Hans G.; McLear, Paul M.; and White, Lester L., 4,578,540, Cl. 179-2.00A.
McPherson, Hugh, to Ferranti plc. Temperature-independent gain control circuit. 4,578,603, Cl. 307-493.000.
Mead Corporation, The: *See—*
Adkins, David G., 4,578,339, Cl. 430-138.000.
Calvert, Rodney K.; and Fishback, Alton J., 4,577,745, Cl. 198-420.000.
Oliff, James R., 4,577,799, Cl. 229-40.000.
Saccocio, Edward J.; Kiser, T. Kay; Wright, Richard F.; and Head, Donald L., 4,578,340, Cl. 430-138.000.
Tsao, Sherman H.; and Sharum, Wayne P., 4,578,713, Cl. 358-283.000.
Mech, Christian; and Gironde, Daniel, to Alsthom-Atlantique. Coupling for electric motors. 4,578,608, Cl. 310-112.000.
Mechtrix Corporation: *See—*
Butler, John D., 4,577,405, Cl. 30-90.100.
Meckler, Gershon, to Camp Dresser & McKee, Inc. Air conditioning apparatus. 4,577,471, Cl. 62-271.000.
Medical Research Associates, Ltd. #2: *See—*
Sterling, Robert E., 4,578,413, Cl. 524-269.000.
Medical Safetec, Inc.: *See—*
Wilson, Joseph H.; Rapp, Jeffrey C.; Southern, Brian K.; and Elliott, Martin E., 4,578,185, Cl. 210-85.000.
Medistad Holland V.V.: *See—*
van Leerdam, Hans M. L., 4,578,074, Cl. 604-408.000.
Medlin, William L., to Mobil Oil Corporation. Method of using seismic data to monitor firefloods. 4,577,690, Cl. 166-251.000.
Medosan Industrie Biochimie Riunite S.p.A.: *See—*
Baglioni, Alessandro, 4,578,481, Cl. 548-539.000.
Medtronic, Inc.: *See—*
Berkovits, Barouh V.; Waxman, Menashe B.; and Combs, William J., 4,577,633, Cl. 128-419.0PG.
Stokes, Kenneth B., 4,577,642, Cl. 128-784.000.
Mee, John D.: *See—*
Freeman, John P.; Macon, Fred M.; and Mee, John D., 4,578,348, Cl. 430-607.000.
Mee, John L.; and Parente, Robert F. Device for measuring and indicating changes in the resistance of a living body. 4,578,635, Cl. 324-62.000.
Meekins, John F.; and Gursky, Herbert, to United States of America, Navy. Polynomial grating. 4,578,804, Cl. 378-84.000.
Mehra, Yuv R. Hydrocarbon separation with a physical solvent. 4,578,094, Cl. 62-17.000.
Meijer, Henricus J. J. C.: *See—*
van Rijsewijk, Lambertus J. J.; Thomas, Mario L.; Meijer, Henricus J. J. C.; and van der Wilk, Ronald, 4,578,661, Cl. 335-212.000.
Melcher, Robert L.: *See—*
Baumann, Thomas; Dacol, Frank H.; and Melcher, Robert L., 4,578,584, Cl. 250-341.000.
Meller, Theo; Knecht, Heinz; and Kuchheuser, Werner, to Boge GmbH. Self-pumping hydropneumatic spring leg or strut with internal level control for motor vehicles. 4,577,840, Cl. 267-64.170.
Melpolder, Frank W., to Atlantic Richfield Company. Stabilized water indicating paste composition. 4,578,357, Cl. 436-39.000.
Melrose, David R.; and Russo, Mario A., to Ingersoll-Rand Company. High speed-high flow spool valve. 4,577,661, Cl. 137-625.330.
Menke, Ronald: *See—*
Holdt, Bernd-Dieter; Menke, Ronald; Praus, Gerd; and Hasselbach, Petra, 4,578,207, Cl. 252-134.000.
Mensi, Carlo: *See—*
Biorcio, Luciano; and Mensi, Carlo, 4,578,312, Cl. 428-336.000.
Merck & Co., Inc.: *See—*
Dolling, Ulf H.; Pines, Seemon H.; and Grabowski, Edward J. J., 4,578,509, Cl. 562-462.000.
Jensen, Norman P.; and Chang, Michael N., 4,578,390, Cl. 514-255.000.
Merck Patent Gesellschaft mit beschrankter Haftung: *See—*
Praefcke, Klaus; Kohne, Bernd; Poules, Wadi; Eidenschink, Rudolf; and Scheuble, Bernhard, 4,578,210, Cl. 252-299.600.
Urban, Manfred; and Schmitt, Dieter, 4,578,202, Cl. 252-33.400.
Mercury Foam Corporation: *See—*
Fenster, Larry A.; and Hostettler, Fritz, 4,577,647, Cl. 132-39.000.
Meredith, Hadyn G., to Rocket of London Limited. Medical instrument. 4,577,635, Cl. 128-642.000.
Meredith, Thomas D., Jr., to Eastman Kodak Company. High density tow bale and method for forming it. 4,577,752, Cl. 206-83.500.
Merlet, Brigitte I. Layer for fixing moquettes, carpets, rugs or the like. 4,578,300, Cl. 428-91.000.
Merlin Gerin: *See—*
Delboese, Andre , 4,578,734, Cl. 361-152.000.
Merlo, Antonia C.: *See—*
Sahasrabudhe, Arum P.; Dadpey, Habib; Cirillo, Fernando A.; Merlo, Antonia C.; and Zuber, Pierre A. M., 4,578,754, Cl. 364-426.000.
Merrell Dow Pharmaceuticals Inc.: *See—*
Cregge, Robert J.; and Coutant, John E., 4,578,464, Cl. 544-236.000.
Merrell, Gene A., to Betz Laboratories, Inc. Method of conditioning fireside fouling deposits using large particle size amorphous silica. 4,577,566, Cl. 110-343.000.
Meserol, Peter M., to Personal Diagnostics, Inc. Cuvette with integral optical elements. 4,577,970, Cl. 356-440.000.
Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung: *See—*
Bongers, Bernd; and Bansemir, Horst, 4,577,736, Cl. 188-371.000.
Kundinger, Josef; Hohmann, Claus; and Muhleck, Martin, 4,578,303, Cl. 428-116.000.
Metal Box Plc: *See—*
Rayner, Adrien P.; and Clark, Kenneth R., 4,577,776, Cl. 220-307.000.
Metal Forms Corporation: *See—*
Miller, Thomas E., 4,577,994, Cl. 404-114.000.

Metallurgie Hoboken-Overpelt: *See*—
Verhoeven, Constant T.; Tobback, Hubert J.; and Dompas, John M., 4,577,401, Cl. 29-825.000.
Metalworking Lasers International Ltd.: *See*—
Hoag, Ethan D., 4,578,792, Cl. 372-58.000.
Metco Inc.: *See*—
Harrington, John H.; and Rangaswamy, Subramaniam, 4,578,115, Cl. 75-255.000.
Rangaswamy, Subramaniam; and Harrington, John H., 4,578,114, Cl. 75-252.000.
Metelski, Andrezej, to Hydrel AG. Wraparound support for a linearly guided slide. 4,577,913, Cl. 308-6.00R.
Meyer, Hans, to Ruhrgas LNG Flussigerdgas Service GmbH. Method for transporting goods by freighter from an arctic port to an ice-free port, and freighter for that purpose. 4,577,578, Cl. 114-248.000.
Meyer, Karl-Heinrich: *See*—
Schmidt, Manfred; and Meyer, Karl-Heinrich, 4,578,476, Cl. 548-144.000.
Michaud, Jeffrey J., to J. D. Tools, Inc. Paint pail holder and wooden ladder adaptor for same. 4,577,820, Cl. 248-211.000.
Micro-Circuits Company: *See*—
Bradley, Robert F., 4,578,215, Cl. 252-514.000.
Microdot Incorporated: *See*—
Zitting, Gordon T., 4,577,874, Cl. 277-165.000.
Middleton, Francisco A.; Carter, Nicholas J. R.; and Das, Santanu, to ITT Corporation. Simultaneous voice and data communication and data base access in a switching system using a tone bus or broadcast mode. 4,578,789, Cl. 370-58.000.
Midland-Ross Corporation: *See*—
Johnson, Keith A.; and Kamlani, Vijay M., 4,578,031, Cl. 432-138.000.
Mifsud, Joseph F., to Exxon Production Research Co. Tunable marine seismic source. 4,578,784, Cl. 367-143.000.
Migliori, Albert; Swift, Gregory W.; and Garrett, Steven L., to United States of America, Energy. Remotely readable fiber optic compass. 4,577,414, Cl. 33-363.00K.
Mihalik, Nandor: *See*—
Readings, Peter B.; Mihalik, Nandor; and Taylor, Robin, 4,578,341, Cl. 430-155.000.
Miki, Yutaka; Nozoe, Toshiro; and Uchimura, Kiyoshi, to Matsushita Electric Industrial Co., Ltd. Multiple display control apparatus for a television receiver. 4,578,698, Cl. 358-22.000.
Mikiya, Toshio: *See*—
Marukawa, Toshio; Nakao, Haruki; and Mikiya, Toshio, 4,577,626, Cl. 128-64.000.
Milan, Rudolph R.: *See*—
Astley, Vivian C.; Milan, Rudolph R.; and Taravella, Jody J., 4,577,804, Cl. 241-16.000.
Milberger, Lionel J.; Lochte, Glen E.; and Masciopinto, Anthony J., to Vetco Offshore, Inc. Mudline support hanger assembly. 4,577,686, Cl. 166-208.000.
Miles, Ronald C.; Justice, David D.; and Dotson, Ronald L., to Olin Corporation. Electrolysis of alkali metal chloride brine in catholyte-less membrane cells employing an oxygen consuming cathode. 4,578,159, Cl. 204-98.000.
Milewits, Marvin: *See*—
Moake, Gordon L.; and Milewits, Marvin, 4,578,642, Cl. 324-160.000.
Miller, C. Fredrick. Workpiece heater. 4,578,032, Cl. 432-230.000.
Miller, Charles R. Coat hanger support. 4,577,766, Cl. 211-123.000.
Miller, Ellsworth S.: *See*—
Slavin, Michael; and Miller, Ellsworth S., 4,578,662, Cl. 335-262.000.
Miller, Jonathan; Berfield, Robert C.; and Crevling, Robert L., Jr., to Shop-Vac Corporation. Vacuum cleaner nozzle having rotating brush. 4,577,366, Cl. 15-388.000.
Miller, Robert C., to Westinghouse Electric Corp. Metering system for measuring parameters of high AC electric energy flowing in an electric conductor. 4,578,639, Cl. 324-96.000.
Miller, Robert C.: *See*—
Gossard, Arthur C.; Miller, Robert C.; and Petroff, Pierre M., 4,578,127, Cl. 148-175.000.
Miller, Thomas E., to Metal Forms Corporation. Vibratory concrete screed. 4,577,994, Cl. 404-114.000.
Milwain, Donald R. Vehicle door support. 4,577,843, Cl. 269-51.000.
Mimura, Yoshiyuki: *See*—
Toda, Akitoshi; and Mimura, Yoshiyuki, 4,578,332, Cl. 430-55.000.
Minami, Kyoji: *See*—
Hamashima, Yoshio; Ishikura, Koji; Kubota, Tadatoshi; and Minami, Kyoji, 4,578,378, Cl. 514-210.000.
Miner, Jon, to International Designs, Inc. Wind responsive adjustable decorative device. 4,578,291, Cl. 428-8.000.
Minigrip Incorporated: *See*—
Ausnit, Steven, 4,578,813, Cl. 383-65.000.
Minnesota Mining and Manufacturing Company: *See*—
Arkell, James J.; and Hamlin, Robert N., 4,578,078, Cl. 623-6.000.
Brochman, Wilfred R., 4,577,777, Cl. 220-359.000.
Hammar, W. James, 4,578,504, Cl. 560-112.000.
Philip, James B., Jr., 4,578,347, Cl. 430-572.000.
Seidel, Udo, 4,578,121, Cl. 134-25.400.
Tait, William C., 4,578,654, Cl. 333-175.000.
Minolta Camera Kabushika Kaisha: *See*—
Yamakawa, Kazuo; and Dohi, Toshihide, 4,577,935, Cl. 350-432.000.
Minolta Camera Kabushiki Kaisha: *See*—
Oka, Tateki, 4,578,337, Cl. 430-107.000.
Mishiro, Shoji, to Taga Electric Co., Ltd. Driving control method of ultrasonic transducer. 4,577,500, Cl. 73-579.000.
Mita Industrial Co., Ltd.: *See*—
Kamezaki, Yasushi, 4,577,587, Cl. 118-658.000.
Mitani, Tsuneyoshi, to Musashi Engineering Kabushiki Kaisha. Method of discriminating sheet. 4,578,770, Cl. 364-571.000.
Mitsubishi Chemical Industries, Ltd.: *See*—
Omae, Yoshihiro; Ishikawa, Kunio; Fukao, Takahisa; and Yoshida, Katsushige, 4,577,385, Cl. 29-402.180.
Wada, Keisuke; Kobayashi, Yoshimitsu; and Kasori, Yukio, 4,578,507, Cl. 560-104.000.
Mitsubishi Denki K.K.: *See*—
Yamada, Tetsusyo; and Hirate, Shintaro, 4,578,172, Cl. 204-412.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Hani, Kiyoshi; Takei, Takako; Kodama, Minekazu; and Sugano, Toshiyuki, 4,578,308, Cl. 428-297.000.
Ito, Sho; Tatsumi, Kenji; Kasahara, Kumio; Nakaguchi, Tomoyuki; Takei, Toshio; and Nakahara, Shojiro, 4,577,863, Cl. 273-26.00R.
Murakami, Masanobu; and Miyazaki, Masaaki, 4,577,603, Cl. 123-339.000.
Oota, Makoto; Nekozuka, Masamichi; and Yagishita, Kikuji, 4,578,672, Cl. 340-702.000.
Takahashi, Ichiro; Okamoto, Goro; and Okahashi, Kazuo, 4,577,664, Cl. 138-149.000.
Yamada, Tetsusyo; and Hirate, Shintaro, 4,578,171, Cl. 204-406.000.
Yuchi, Kazuhide, 4,577,800, Cl. 237-2.00A.
Mitsubishi Gas Chemical Company, Inc.: *See*—
Sakurai, Masanori; Miyawaki, Junichi; Umemura, Toshikaju; Kawata, Toshikatsu; and Kiboshi, Shinji, 4,578,422, Cl. 524-593.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Irie, Nobuhiko, 4,578,023, Cl. 425-38.000.
Mitsuboshi Belting Ltd.: *See*—
Takano, Hiroshi, 4,578,050, Cl. 474-17.000.
Mitsui Mining & Smelting Co., Ltd.: *See*—
Miyazaki, Kazuhide; Uemura, Toyohide; and Nakaso, Katsuzo, 4,578,109, Cl. 75-0.50C.
Miwa, Zenichiro: *See*—
Nakagawa, Hiroshi; and Miwa, Zenichiro, 4,578,622, Cl. 318-135.000.
Miyagawa, Seiichi: *See*—
Ikeda, Itsuo; Kurokawa, Junji; Hasebe, Mitsuo; Miyagawa, Seiichi; and Hariu, Hajime, 4,578,331, Cl. 430-42.000.
Miyajiri, Tetsuo: *See*—
Tanaka, Gotaro; Fujiwara, Kunio; and Miyajiri, Tetsuo, 4,578,560, Cl. 219-121.0PR.
Miyakawa, Eiji, to Miyakawa Industry Co., Ltd. Exchange chuck for a tool. 4,577,875, Cl. 279-75.000.
Miyakawa Industry Co., Ltd.: *See*—
Miyakawa, Eiji, 4,577,875, Cl. 279-75.000.
Miyakawa, Nobuaki: *See*—
Yazawa, Yoshiaki; Miyakawa, Nobuaki; Mukai, Toji; Ikeda, Takahide; and Kamei, Tatsuya, 4,578,693, Cl. 357-30.000.
Miyake, Takashi: *See*—
Ikemoto, Kazuhito; Terakura, Yukio; and Miyake, Takashi, 4,577,525, Cl. 74-440.000.
Miyamoto, Shigeo: *See*—
Ebisawa, Hiroo; Maruyama, Iwao; Fukuda, Masao; and Miyamoto, Shigeo, 4,578,281, Cl. 427-53.100.
Miyawaki, Junichi: *See*—
Sakurai, Masanori; Miyawaki, Junichi; Umemura, Toshikaju; Kawata, Toshikatsu; and Kiboshi, Shinji, 4,578,422, Cl. 524-593.000.
Miyazaki, Kazuhide; Uemura, Toyohide; and Nakaso, Katsuzo, to Mitsui Mining & Smelting Co., Ltd. Process for the production of anode active materials for use in cells. 4,578,109, Cl. 75-0.50C.
Miyazaki, Kenichi: *See*—
Takanashi, Itsuo; Nakagaki, Shintaro; Miyazaki, Kenichi; and Kuriyama, Takashi, 4,578,699, Cl. 358-44.000.
Miyazaki, Masaaki: *See*—
Murakami, Masanobu; and Miyazaki, Masaaki, 4,577,603, Cl. 123-339.000.
Miyazaki, Senji; and Touya, Osamu, to Idemitsu Petrochemical Co., Ltd. Thermoformed polyolefin cup. 4,578,296, Cl. 428-35.000.
Miyoshi, Takahito: *See*—
Ishikuro, Tadashi; Shirahata, Ryuji; Miyoshi, Takahito; and Fujiyama, Masaaki, 4,578,311, Cl. 428-336.000.
Mo och Domsjo Aktiebolag: *See*—
Lindahl, Jonas A. I.; and Johnsson, Gustaf E., 4,578,147, Cl. 162-26.000.
Lindahl, Jonas A. I., 4,578,148, Cl. 162-26.000.
Moak, Ross D. Sod cutting apparatus. 4,577,697, Cl. 172-21.000.
Moake, Gordon L.; and Milewits, Marvin, to PA Incorporated. Method and apparatus for measuring velocity of ferromagnetic tubing. 4,578,642, Cl. 324-160.000.
Mobay Chemical Corporation: *See*—
Jackman, Dennis E.; and Westphal, Dietmar B., 4,578,463, Cl. 544-182.000.
Krishnan, Sivaram; Grigo, Ulrich R.; and Folajtar, Donald A., 4,578,409, Cl. 524-94.000.
Mobil Oil Corporation: *See*—
Chang, Clarence D.; and Hellring, Stuart D., 4,578,521, Cl. 568-771.000.
Chou, Tai-Sheng; and Lee, Chang-Kuei, 4,578,183, Cl. 208-113.000.
Clauson, Melvil B.; and Wagner, John R., Jr., 4,578,316, Cl. 428-516.000.

Dellinger, Thomas B.; Boston, William G.; Sexton, James H.; and Strong, Robert T., 4,577,700, Cl. 175-40.000.
Dellinger, Thomas B.; and Gravley, Wilton, 4,577,701, Cl. 175-61.000.
Derouane, Eric G.; and Varghese, Philip, 4,578,181, Cl. 208-110.000.
Dion, Eric P., 4,578,579, Cl. 250-256.000.
Duncan, Gary L., 4,578,297, Cl. 428-35.000.
Hoehn, Gustave L., Jr., 4,578,645, Cl. 324-338.000.
Medlin, William L., 4,577,690, Cl. 166-251.000.
Shaw, Richard G.; and Canterino, Peter J., 4,578,431, Cl. 525-387.000.
Trivedi, Viren P., 4,578,416, Cl. 524-371.000.

Mobilio, Dominick; Demerson, Christopher A.; and Humber, Leslie G., to American Home Products Corporation. Substituted 2,3,4,9-tetrahydro-1H-carbazole-1-acetic acid, compositions and use. 4,578,398, Cl. 514-411.000.

Mobley, David P., to General Electric Company. Two-stage process for preparation of polyphenylene oxides. 4,578,449, Cl. 528-212.000.

Mochida, Nobuo: *See*—
Ohnishi, Haruo; Yamaguchi, Kazuo; Suzuki, Yasuo; and Mochida, Nobuo, 4,578,400, Cl. 514-460.000.

Mochida Pharmaceutical Co., Ltd.: *See*—
Ohnishi, Haruo; Yamaguchi, Kazuo; Suzuki, Yasuo; and Mochida, Nobuo, 4,578,400, Cl. 514-460.000.

Mod, William A.: *See*—
Ezzell, Bobby R.; Carl, William P.; and Mod, William A., 4,578,512, Cl. 562-586.000.

Moeller, Dieter: *See*—
Lenz, Werner; Sander, Hans; and Moeller, Dieter, 4,578,426, Cl. 525-131.000.

Molex Incorporated: *See*—
Pellegrino, Thomas P., 4,577,404, Cl. 29-874.000.
Stipanuk, John M.; Walse, Alan S.; and Regnier, Kent E., 4,577,922, Cl. 339-176.0MP.

Moll, Manfred: *See*—
Romer, Rudolf; and Moll, Manfred, 4,577,813, Cl. 244-3.230.

Moller, Goran: *See*—
Lehto, Eino; Moller, Goran; and Sjovall, Lasse, 4,577,997, Cl. 405-43.000.

Molo, Francesco; Cucchi, Silvio; and Cariolaro, Gianfranco, to Telettra-Telefonia Elettronica e Radio S.p.A. Corso Buenos Aires. System and equipment for single side band multiplexing through digital processing. 4,578,790, Cl. 370-50.000.

Molten Corporation: *See*—
Shishido, Hideomi, 4,577,865, Cl. 273-58.00G.

Molteni, Emanuele, to Bayer Aktiengesellschaft. Process for the production of polyolefin foams. 4,578,231, Cl. 264-25.000.

Monarch Marking Systems, Inc.: *See*—
Hamisch, Paul H., Jr.; Vanderpool, James L.; and Bain, James M., 4,578,138, Cl. 156-361.000.
Jenkins, William A., 4,577,426, Cl. 40-21.00R.

Monolithic Memories, Inc.: *See*—
Hsia, Steve; and Chang, Paul, 4,577,391, Cl. 29-571.000.

Monsanto Company: *See*—
D'Amico, John J., 4,578,477, Cl. 548-165.000.
Deets, Gary L.; and Trementozzi, Quirino A., 4,578,423, Cl. 525-68.000.
Fowler, James D., 4,578,190, Cl. 210-321.100.
Getman, Daniel P., 4,578,514, Cl. 564-102.000.

Montedison S.p.A.: *See*—
Clementini, Luciano; and Spagnoli, Leonardo, 4,578,428, Cl. 525-265.000.

Monterey Manufacturing Co.: *See*—
Hall, Charles P.; and Philipson, Joseph, 4,577,357, Cl. 5-451.000.
Johenning, John B.; and Hall, Charles P., 4,577,356, Cl. 5-450.000.

Montgomery, Robert E.: *See*—
Pellico, Michael A.; and Montgomery, Robert E., 4,578,265, Cl. 424-50.000.

Moon, Donald A. Automotive engine oil drip pan. 4,577,713, Cl. 180-69.100.

Mooney, Charles W.; Phipps, Robert E.; and Kuznicki, William J., to Motorola, Inc. Shock absorber for quartz crystal enclosures using multiple contact points to distribute stress. 4,577,735, Cl. 188-268.000.

Mooney, Charles W., to Motorola, Inc. Shock absorber and spacer for quartz crystals. 4,578,612, Cl. 310-348.000.

Moore, Colin; and Jenkins, David P., to BOC Group, plc, The. Method of combustion and burners. 4,577,567, Cl. 110-347.000.

Moore, James I., to Ex-Cell-O Corporation. Vacuum control system for casting machine dies. 4,577,670, Cl. 164-155.000.

Moore, Sanders H.; Smith, Maurice R.; and Cochran, Harvey B., to Olin Corporation. Process for the purification of effluents and purge streams containing trace elements. 4,578,195, Cl. 210-679.000.

Moore, William P., to Hawkeye Chemical Company. Stable ureaform dispersion fertilizers. 4,578,105, Cl. 71-28.000.

Mordarski, Walter J.; and Markiewicz, Jan, to Combustion Engineering, Inc. Nondestructive determination of nuclear fuel burnup. 4,578,237, Cl. 376-154.000.

Morein, Bror. Immunogenic protein or peptide complex, method or producing said complex and the use thereof as an immune stimulant and as a vaccine. 4,578,269, Cl. 424-88.000.

Moreiras, Luis, to Parker-Hannifin Corporation. Split back die segment. 4,577,485, Cl. 72-402.000.

Morel, Michel; and Pillac, Bernard, to CLECIM. Hydraulic safety device for a mechanism for closing up the rolls of a rolling mill. 4,577,484, Cl. 72-245.000.

Morgan, Thomas A., to Honeywell Information Systems Inc. Pin insertion tool. 4,577,400, Cl. 29-739.000.

Morganite Electrical Carbon Limited: *See*—
Ferguson, Ian C., 4,578,546, Cl. 191-87.000.

Mori, Toshikatsu; Takeuchi, Seizi; Matsuda, Shimpei; Kumagi, Teruo; Kato, Akira; Yamashita, Hisao; and Takeuchi, Masato, to Hitachi, Ltd. Catalytic reaction process. 4,578,112, Cl. 75-108.000.

Mori, Yasuharu: *See*—
Tokuno, Masateru; Sawada, Tetsuya; and Mori, Yasuharu, 4,577,746, Cl. 198-462.000.

Morimoto, Nobuyuki; Takatsu, Kozo; and Sugimoto, Michio, to Research Association for Petroleum Alternatives Development. Process for preparing a crystalline aluminosilicate. 4,578,259, Cl. 423-329.000.

Morimoto, Yoshiro: *See*—
Niikura, Yasuhiro; Morimoto, Yoshiro; Hamada, Hideo; Suga, Masaaki; and Murasugi, Takashi, 4,577,737, Cl. 192-0.032.

Morin, Thomas M. Swimming pool filter system. 4,578,186, Cl. 210-90.000.

Morisawa, Tahei, to Asahi Kogaku Kogyo K.K. Electromagnetic release device for single-lens reflex camera. 4,577,946, Cl. 354-152.000.

Morita, Kazuhiko: *See*—
Kato, Mikihiko; Okita, Tsutomu; Komine, Shigeo; Okuzawa, Yasutoshi; and Morita, Kazuhiko, 4,578,299, Cl. 428-65.000.

Morita, Tetuya; Wakasa, Akinori; Ogawa, Yutaka; and Ogasawara, Takayuki, to Mazda Motor Corporation; and NGK Insulators, Ltd. Structure of divided combustion chamber for diesel engine. 4,577,600, Cl. 123-270.000.

Moritani, Atsushi: *See*—
Maio, Kenji; and Moritani, Atsushi, 4,578,646, Cl. 328-128.000.

Moriyama, Noboru: *See*—
Murai, Osamu; and Moriyama, Noboru, 4,578,441, Cl. 526-216.000.

Morley, Robert G. Frozen whipped cream. 4,578,276, Cl. 426-565.000.

Morris, Alvan M.: *See*—
Morris, Fredric H.; and Morris, Alvan M., 4,577,586, Cl. 118-63.000.

Morris, Anthony F.; Delay, Francois; Gautschi, Fritz; Thomas, Alan F.; Giersch, Wolfgang K.; and Boschung, Andre , to Firmenich SA. 1(7)-p-Menthen-9-al and its utilization as perfuming and flavoring ingredient. 4,578,277, Cl. 426-538.000.

Morris, Fredric H.; and Morris, Alvan M. Automatic ski waxing machine. 4,577,586, Cl. 118-63.000.

Morris, Robert C.: *See*—
Chai, Bruce H.; Buehler, Ernest; Flynn, John J.; and Morris, Robert C., 4,578,146, Cl. 156-623.00R.

Morsdorf, Peter: *See*—
Schickaneder, Helmut; Szeleny, Istvan; Morsdorf, Peter; and Ahrens, Kurt H., 4,578,389, Cl. 514-254.000.

Mortimer, John H., to Inductotherm Corporation. Levitation heating using single variable frequency power supply. 4,578,552, Cl. 219-10.410.

Morton Metalcraft Company: *See*—
Stratton, David M., 4,577,354, Cl. 4-585.000.

Morton Thiokol, Inc.: *See*—
Bolieau, Christopher W., 4,578,247, Cl. 422-165.000.
Salamone, Ann B., 4,578,267, Cl. 424-78.000.

Morz, Gunter, to Ant Nachrichtentechnik GmbH. Method and apparatus for obtaining antenna tracking signals. 4,578,679, Cl. 343-427.000.

Moser, Bernd, to Boge GmbH. Arrangement for determining the travel of a piston. 4,577,509, Cl. 73-658.000.

Mossle, Walter; and Eibofner, Eugen, to Kaltenbach & Voight GmbH & Co. Tartar-removing dental handpiece. 4,578,033, Cl. 433-29.000.

Motodate, Shoji: *See*—
Nashimoto, Ryo; and Motodate, Shoji, 4,577,917, Cl. 339-150.00T.

Motorola, Inc.: *See*—
Birch, William A.; and Woodard, Lillie M., 4,578,599, Cl. 307-272.00A.
Kraft, Douglas R.; and Elrod, Harry F., 4,578,782, Cl. 365-222.000.
McAlister, Doyle V.; and Crisp, Richard D., 4,578,601, Cl. 307-475.000.
McKee, John M.; and MacDonald, John F., 4,578,739, Cl. 361-395.000.
Mooney, Charles W.; Phipps, Robert E.; and Kuznicki, William J., 4,577,735, Cl. 188-268.000.
Mooney, Charles W., 4,578,612, Cl. 310-348.000.
Persinotti, Gary W., 4,578,815, Cl. 455-15.000.
Shupe, Chester D., 4,578,649, Cl. 331-78.000.
Siwiak, Kazimierz, 4,578,628, Cl. 320-2.000.

Mount Isa Mines Limited: *See*—
Cunningham, Jock B., 4,577,502, Cl. 73-600.000.

MPC Products Corporation: *See*—
Carlson, Richard K., 4,577,990, Cl. 403-342.000.

MTU Motoren-und Turbinen-Union Friedrichshafen, GmbH: *See*—
Deutschmann, Herbert; and Schier, Karl, 4,577,595, Cl. 123-41.350.

MTU Motoren- und Turbinen-Union Munchen GmbH: *See*—
Hagemeister, Klaus, 4,577,684, Cl. 165-172.000.

Mueller, Richard L., Jr., to Argon Medical Corp. Flexible metal radiopaque indicator and plugs for catheters. 4,577,637, Cl. 128-658.000.

Mueller, Wayne A.: *See*—
Arp, Bradley W.; Lindberg, Ronald O. J.; and Mueller, Wayne A., 4,578,569, Cl. 235-454.000.

Muenstedt, Helmut; and Naarmann, Herbert, to BASF Aktiengesellschaft. Long-term stability of the electrical conductivity of pyrrole polymers. 4,578,433, Cl. 525-417.000.

Muhleck, Martin: *See*—
Kundinger, Josef; Hohmann, Claus; and Muhleck, Martin, 4,578,303, Cl. 428-116.000.

Mukai, Toji: *See*—
Yazawa, Yoshiaki; Miyakawa, Nobuaki; Mukai, Toji; Ikeda, Takahide; and Kamei, Tatsuya, 4,578,693, Cl. 357-30.000.

Mukaida, Yutaka: *See*—
Takita, Hitoshi; Noda, Sakuo; Mukaida, Yutaka; and Kobayashi, Hidetoshi, 4,578,404, Cl. 514-567.000.

Muller, Arno, to Pitney Bowes Inc. Electronic postage meter having a regulated power supply system responsive to a voltage developed in a transformer primary winding circuit. 4,578,758, Cl. 364-466.000.

Muller, Arno, to Pitney Bowes Inc. System for limiting access to non-volatile memory in electronic postage meters. 4,578,774, Cl. 364-900.000.

Muller, Daniel: *See*—
Armand, Michel; Muller, Daniel; Duval, Michel; and Harvey, Paul-Etienne, 4,578,326, Cl. 429-192.000.

Muller, Hans, to DrM Dr. Muller AG. Method of and filter thickener for thickening of suspensions. 4,578,197, Cl. 210-772.000.

Muller, Hans-Rudolf. Filter cloth for a disk filter. 4,578,192, Cl. 210-486.000.

Muller, Johannes C. A., to U.S. Philips Corporation. VCR with improved fast winding static electricity drain. 4,578,725, Cl. 360-85.000.

Muller, Marcel: *See*—
Furst, Andor; Muller, Marcel; Kerb, Ulrich; and Wiechert, Rudolf, 4,578,475, Cl. 548-126.000.

Muller, Reinhardt: *See*—
Gollub, Erwin; and Muller, Reinhardt, 4,577,988, Cl. 403-140.000.

Muller, Thomas; and Siegemund, Gunter, to Hoechst Aktiengesellschaft. Process for the regeneration of fluorination catalysts. 4,578,369, Cl. 502-36.000.

Muller, Wilhelm, to Postalia GmbH. Device for singling out stacked sheets. 4,577,851, Cl. 271-33.000.

Multifibre Process Limited: *See*—
Lobley, Derek G., 4,578,261, Cl. 423-478.000.

Mundt, Randall S.; and Wyatt, Ray E., to NCR Corporation. Process for forming retrograde dopant distributions utilizing simultaneous outdiffusion of dopants. 4,578,128, Cl. 148-191.000.

Munnion, Derek, to Link Electronics Limited. Camera support assembly. 4,578,708, Cl. 358-229.000.

Murai, Osamu; and Moriyama, Noboru, to Kao Corporation. Emulsion polymerization process for production of α-methylstyrene copolymer. 4,578,441, Cl. 526-216.000.

Murakami, Masanobu; and Miyazaki, Masaaki, to Mitsubishi Denki Kabushiki Kaisha. Device for controlling engine RPM. 4,577,603, Cl. 123-339.000.

Murakami, Shuji: *See*—
Yasuda, Yutaka; Hirata, Yasuo; Murakami, Shuji; Nakamura, Katsuhiro; and Furuya, Yukitsuna, 4,578,800, Cl. 375-106.000.

Murakami, Toshiaki; Enomoto, Yoichi; and Suzuki, Minoru, to Nippon Telephone & Telegraph Public Corporation. Photodetecting device. 4,578,691, Cl. 357-5.000.

Murase, Takao: *See*—
Kato, Nobuhide; and Murase, Takao, 4,578,174, Cl. 204-429.000.

Murasugi, Takashi: *See*—
Niikura, Yasuhiro; Morimoto, Yoshiro; Hamada, Hideo; Suga, Masaaki; and Murasugi, Takashi, 4,577,737, Cl. 192-0.032.

Murayama, Naohiro: *See*—
Sakagami, Teruo; Fujii, Yasufumi; and Murayama, Naohiro, 4,578,445, Cl. 526-292.300.

Murdoch, Iain H.: *See*—
Bray, David J.; Johnson, Peter E.; Marshall, Peter E. G.; Piper, Francis R.; and Murdoch, Iain H., 4,577,490, Cl. 73-40.700.

Murro, Ronald P.: *See*—
Gidge, Lester; and Murro, Ronald P., 4,578,141, Cl. 156-439.000.

Murtz, Robert. Device for cleaning containers. 4,577,651, Cl. 134-111.000.

Musashi Engineering Kabushiki Kaisha: *See*—
Mitani, Tsuneyoshi, 4,578,770, Cl. 364-571.000.

Myers, Daniel N.: *See*—
Cetinkaya, Ismail B.; and Myers, Daniel N., 4,578,366, Cl. 502-6.000.

Myers, Kimbrough I.: *See*—
Granzow, Robert H.; Gupta, Desh B.; and Myers, Kimbrough I., 4,578,567, Cl. 235-380.000.

Myrens Verksted A/S: *See*—
Andersen, Per B.; and Richter, Ole J., 4,577,663, Cl. 138-31.000.

N. Zivy & Cie, S.A.: *See*—
Lowenheck, Konrad, 4,577,512, Cl. 73-862.450.

Naarmann, Herbert: *See*—
Muenstedt, Helmut; and Naarmann, Herbert, 4,578,433, Cl. 525-417.000.

Nabata, Hiroyuki: *See*—
Nagano, Hiroyuki; Takagi, Mitiro; Kubodera, Noboru; Matsunaga, Isao; Nabata, Hiroyuki; Ohba, Yasuhiro; Sakai, Kazushige; Hata, Shun-ichi; and Uchida, Yasumi, 4,578,465, Cl. 544-285.000.

Nabeshima, Kenjiro: *See*—
Tomita, Yukio; Nabeshima, Kenjiro; and Shibamoto, Nobuji, 4,577,564, Cl. 110-110.000.

Nabisco Brands, Inc.: *See*—
Koppa, Daniel A.; and Schaeder, Walter, 4,578,027, Cl. 425-298.000.
Spanier, Henry C., 4,578,275, Cl. 426-302.000.

Nadaskay, Richard J., to International Paper Company. Easy-open pinch closure bag. 4,577,761, Cl. 206-604.000.

Nagafuchi, Kazumasa, to Kisokaseisangyou Co., Ltd. Composite films for protecting documents from being reproduced. 4,578,298, Cl. 428-40.000.

Nagahara, Shuusaku: *See*—
Ozawa, Naoki; Akiyama, Toshiyuki; Nagahara, Shuusaku; Ohba, Shinya; Ando, Haruhisa; and Ozaki, Toshifumi, 4,578,707, Cl. 358-212.000.

Nagami, Hayashi: *See*—
Shimizu, Keizo; Otsu, Shimpei; Fujimura, Toshio; Taniguchi, Yoshisada; and Nagami, Hayashi, 4,578,787, Cl. 369-77.200.

Nagano, Hikoichi: *See*—
Uno, Keiichi; Nagano, Hikoichi; and Ikegami, Tadashi, 4,578,166, Cl. 8-115.520.

Nagano, Hiroyuki; Takagi, Mitiro; Kubodera, Noboru; Matsunaga, Isao; Nabata, Hiroyuki; Ohba, Yasuhiro; Sakai, Kazushige; Hata, Shun-ichi; and Uchida, Yasumi, to Chugai Seiyaku Kabushiki Kaisha. Phenyliperazine derivatives. 4,578,465, Cl. 544-285.000.

Nagaoka Kanaami Kabushiki Kaisha: *See*—
Nagaoka, Tadayoshi, 4,578,248, Cl. 422-310.000.

Nagaoka, Tadayoshi, to Nagaoka Kanaami Kabushiki Kaisha. Distributor/collector assembly. 4,578,248, Cl. 422-310.000.

Nagasawa, Ken: *See*—
Yuriate, Kozo; and Nagasawa, Ken, 4,578,177, Cl. 208-45.000.

Nagasuye, Joseph H.: *See*—
Assarsson, Per G.; and Nagasuye, Joseph H., 4,578,353, Cl. 435-161.000.

Nagumo, Ryoichi: *See*—
Sakamoto, Masami; Nagumo, Ryoichi; and Ishihara, Tamio, 4,577,409, Cl. 33-18.100.

Nagy, Charles E. Shoe protector. 4,577,418, Cl. 36-72.00B.

Nagy, Charles S.: *See*—
Granzow, Robert H.; Daulton, Richard H.; Placke, Dale L.; Adelberger, Donald L.; Gross, Jack R.; and Nagy, Charles S., 4,578,009, Cl. 414-43.000.
Placke, Dale L.; Filliman, Mark D.; Granzow, Robert H.; Gross, Jack R.; and Nagy, Charles S., 4,577,763, Cl. 209-534.000.

Nahr, Wolfgang: *See*—
Forner, Siegfried; Langhammer, Karl-Heinz; Pellkofer, Dieter; and Nahr, Wolfgang, 4,577,795, Cl. 228-29.000.

Naka, Junichi: *See*—
Taneda, Kozo; Chiba, Masae; Naka, Junichi; and Watanabe, Shunichi, 4,578,002, Cl. 406-28.000.

Nakada, Naoki: *See*—
Tsukutani, Seiichi; and Nakada, Naoki, 4,578,623, Cl. 318-254.000.

Nakagaki, Shintaro: *See*—
Takanashi, Itsuo; Nakagaki, Shintaro; Miyazaki, Kenichi; and Kuriyama, Takashi, 4,578,699, Cl. 358-44.000.

Nakagawa, Hiroshi; and Miwa, Zenichiro, to Shinko Electric Co., Ltd. Linear pulse motor. 4,578,622, Cl. 318-135.000.

Nakagawa, Kazuyuki: *See*—
Uchida, Minoru; Komastu, Makoto; and Nakagawa, Kazuyuki, 4,578,381, Cl. 514-233.000.

Nakaguchi, Tomoyuki: *See*—
Ito, Sho; Tatsumi, Kenji; Kasahara, Kumio; Nakaguchi, Tomoyuki; Takei, Toshio; and Nakahara, Shojiro, 4,577,863, Cl. 273-26.00R.

Nakahara, Shojiro: *See*—
Ito, Sho; Tatsumi, Kenji; Kasahara, Kumio; Nakaguchi, Tomoyuki; Takei, Toshio; and Nakahara, Shojiro, 4,577,863, Cl. 273-26.00R.

Nakai, Takeshi: *See*—
Ishikawa, Nobuo; Nakai, Takeshi; and Inouye, Yoshio, 4,578,503, Cl. 560-82.000.

Nakaji, Etsuo, to Dainippon Screen Mfg. Co., Ltd. Method of recording an optional number of color separation images in an optional order and in optional positions on a recording medium. 4,578,701, Cl. 358-78.000.

Nakajima, Setsuo: *See*—
Sugisawa, Ko; Shibuki, Masaru; Imada, Imayoshi; Katada, Jun; Yamamoto, Yozo; Nakajima, Setsuo; Kishi, Toshio; and Sugano, Shozo, 4,578,274, Cl. 426-96.000.

Nakajima, Toshio, to Teraoka Seiko Co., Ltd. Cassette type labeler and cassette case. 4,578,140, Cl. 156-384.000.

Nakamura, Katsuhiro: *See*—
Yasuda, Yutaka; Hirata, Yasuo; Murakami, Shuji; Nakamura, Katsuhiro; and Furuya, Yukitsuna, 4,578,800, Cl. 375-106.000.

Nakamura, Keiji, to Nippon Piston Ring Co., Ltd. Journal. 4,578,317, Cl. 428-547.000.

Nakamura, Michio: *See*—
Komatsu, Shigeru; Inoue, Hiroshi; and Nakamura, Michio, 4,577,397, Cl. 29-576.00B.

Nakamura, Taizo; and Kawahara, Katsuyuki, to Kabushiki Kaisha Toshiba. Method for stopping a multi-stage hydraulic machine. 4,578,017, Cl. 415-1.000.

Nakane, Hisashi: *See*—
Hijikata, Isamu; Uehara, Akira; and Nakane, Hisashi, 4,578,559, Cl. 219-121.0PE.

Nakanishi Dental Mfg. Co., Ltd.: *See*—
Shibata, Yuichi; and Baba, Tadashi, 4,578,034, Cl. 433-29.000.

Nakanishi, Mikihiko, to Sakura Color Products Corp. Erasable ink composition. 4,578,117, Cl. 106-20.000.

Nakanishi, Toshiharu: *See*—
Ohigashi, Hiroji; Koga, Keiko; and Nakanishi, Toshiharu, 4,578,442, Cl. 526-255.000.

Nakano, Akihiko; Matsumoto, Hitoshi; Uda, Hiroshi; Komatsu, Yasumasa; Kuribayashi, Kiyoshi; and Ikegami, Seiji, to Matsushita Electric Industrial Co., Ltd. Solar module. 4,578,526, Cl. 136-251.000.

Nakano, Masao: *See*—
Ogawa, Junji; Nakano, Tomio; Nakano, Masao; Tsuge, Norihisa; and Horii, Takashi, 4,578,781, Cl. 365-203.000.
Nakano, Shinji: *See*—
Umemoto, Hirotoshi; Tanabe, Hisaki; Kanakura, Akihiro; and Nakano, Shinji, 4,578,436, Cl. 525-443.000.
Nakano, Tomio: *See*—
Ogawa, Junji; Nakano, Tomio; Nakano, Masao; Tsuge, Norihisa; and Horii, Takashi, 4,578,781, Cl. 365-203.000.
Takemae, Yoshihiro; Nakano, Tomio; and Sato, Kimiaki, 4,578,776, Cl. 365-149.000.
Nakao, Haruki: *See*—
Marukawa, Toshio; Nakao, Haruki; and Mikiya, Toshio, 4,577,626, Cl. 128-64.000.
Nakashima, Kunihiko: *See*—
Nakazawa, Takaaki; Kazaoka, Kenichi; Okazaki, Nobuo; and Nakashima, Kunihiko, 4,578,592, Cl. 307-10.00R.
Nakaso, Katsuzo: *See*—
Miyazaki, Kazuhide; Uemura, Toyohide; and Nakaso, Katsuzo, 4,578,109, Cl. 75-0.50C.
Nakayama, Motohiro: *See*—
Kanamaru, Tatsuya; Nakayama, Motohiro; Ogawa, Yutaka; and Arai, Katutoshi A., 4,578,158, Cl. 204-44.200.
Nakayama, Noriaki: *See*—
Kosemura, Kinjiro; Yamashita, Yoshimi; Nakayama, Noriaki; and Yamamoto, Sumio, 4,578,343, Cl. 430-296.000.
Nakayama, Norio: *See*—
Kitamura, Masao; Nakayama, Norio; Katsura, Ryoei; Ibe, Hidefumi; and Uchida, Shunsuke, 4,578,154, Cl. 204-1.00T.
Nakazawa, Takaaki; Kazaoka, Kenichi; Okazaki, Nobuo; and Nakashima, Kunihiko, to Aisin Seiki Kabushiki Kaisha; and Toyoda Gosei Co., Ltd. Steering wheel assembly with centralized control system. 4,578,592, Cl. 307-10.00R.
Nalco Chemical Company: *See*—
Roe, William J.; and Malito, John T., 4,578,255, Cl. 423-130.000.
Narasimham, Pundi L.: *See*—
Gill, Roger F.; and Narasimham, Pundi L., 4,578,253, Cl. 423-87.000.
Narukawa, Atsushi, to Sharp Kabushiki Kaisha. Apparatus for detecting normal/abnormal mounting of belt-like photosensitive member in copying machine. 4,577,953, Cl. 355-3.0BE.
Narzul, Marcel: *See*—
Urien, Jacques; Bressan, Elie; Danguy, Jacques; and Narzul, Marcel, 4,578,658, Cl. 333-227.000.
Nashimoto, Ryo; and Motodate, Shoji, to Honda Giken Kogyo Kabushiki Kaisha. Coupler connecting device. 4,577,917, Cl. 339-150.00T.
Nashua Corporation: *See*—
Veillette, Norman T.; and Malik, Robert J., 4,578,690, Cl. 346-212.000.
National Semiconductor Corporation: *See*—
Peel, John L., 4,577,394, Cl. 29-576.00W.
National Starch and Chemical Corporation: *See*—
Rossi, Robert D.; and Ray-Chaudhuri, Dilip K., 4,578,444, Cl. 526-288.000.
Schmidt, Robert C., Jr.; and Puletti, Paul P., 4,578,302, Cl. 428-110.000.
Nawa, Hiroyoshi: *See*—
Imai, Kazuhiro; Ogata, Hiroshi; Tanaka, Motoaki; Nawa, Hiroyoshi; and Ishihara, Masami, 4,578,499, Cl. 560-21.000.
Nazarian, Ara W.; and Stupeck, Donald G., to Computer Memories, Inc. Spindle drive control system. 4,578,625, Cl. 318-318.000.
NCR CANADA LTD.-NCR CANADA LTEE: *See*—
Mazumder, Ali T.; and Dumas, Armand M., 4,578,570, Cl. 235-463.000.
NCR Corporation: *See*—
Granzow, Robert H.; Daulton, Richard H.; Placke, Dale L.; Adelberger, Donald L.; Gross, Jack R.; and Nagy, Charles S., 4,578,009, Cl. 414-43.000.
Granzow, Robert H.; Gupta, Desh B.; and Myers, Kimbrough I., 4,578,567, Cl. 235-380.000.
Mundt, Randall S.; and Wyatt, Ray E., 4,578,128, Cl. 148-191.000.
Placke, Dale L.; Filliman, Mark D.; Granzow, Robert H.; Gross, Jack R.; and Nagy, Charles S., 4,577,763, Cl. 209-534.000.
NEC Corporation: *See*—
Hamaguchi, Hiroyuki, 4,578,304, Cl. 428-209.000.
Ikemizu, Hiroshi, 4,577,923, Cl. 339-275.00B.
Yui, Yoshio, 4,578,812, Cl. 382-41.000.
Neefe, Charles W. Method of contouring the edge of contact lenses. 4,578,230, Cl. 264-2.100.
Nehmiz, Peter: *See*—
Behringer, Uwe; Bohlen, Harald; Nehmiz, Peter; and Zapka, Werner, 4,578,587, Cl. 250-492.200.
Nei Canada Limited: *See*—
Browne, John, 4,577,427, Cl. 40-449.000.
Neki, Shigeo; Shinozaki, Nozomu; and Dohi, Takashi, to Matsushita Electric Industrial Co., Ltd. Speed setting arrangement for sewing machines. 4,578,624, Cl. 318-305.000.
Nekozuka, Masamichi: *See*—
Oota, Makoto; Nekozuka, Masamichi; and Yagishita, Kikuji, 4,578,672, Cl. 340-702.000.
Nenninger, Klaus: *See*—
van Rijckevorsel, Rainer; Kasielke, Joachim; Macho, Heinz; Schafer, Peter; and Nenninger, Klaus, 4,578,716, Cl. 360-1.000.
Nestler, Heinz: *See*—
Barfurth, Dieter; and Nestler, Heinz, 4,578,487, Cl. 556-40.000.
Netsch, Miles. Bracket and tooth assembly for planter. 4,577,568, Cl. 111-7.000.
Neumann, Ulrich: *See*—
Siedel, Joachim; Neumann, Ulrich; Ziegenhorn, Joachim; Batz, Hans-Georg; Lenz, Helmut; Pautz, Brigitte; and Albert, Winfried, 4,578,361, Cl. 436-547.000.
Neumuenstersche Maschinen- und Apparatebau Gesellschaft mbH (NEUMAG): *See*—
Bauch, Ernst, 4,577,537, Cl. 83-343.000.
New Products I, Inc.: *See*—
Geschwender, Robert C., 4,577,767, Cl. 211-190.000.
New York Blood Center, Inc.: *See*—
Vnek, John; Prince, Alfred M.; and Ikram, Hafeez, 4,578,217, Cl. 260-112.50R.
Newton, Charles L., to Air Products and Chemicals, Inc. Sectioned bubble tray distillation over a wide range of feed composition and bubble tray loading. 4,578,153, Cl. 203-99.000.
NGK Insulators, Ltd.: *See*—
Kato, Nobuhide; and Murase, Takao, 4,578,174, Cl. 204-429.000.
Morita, Tetuya; Wakasa, Akinori; Ogawa, Yutaka; and Ogasawara, Takayuki, 4,577,600, Cl. 123-270.000.
NGK Spark Plug Co.: *See*—
Yamada, Tetsusyo; and Hirate, Shintaro, 4,578,172, Cl. 204-412.000.
NGK Spark Plug Co., Ltd.: *See*—
Tanaka, Hiroshi; and Baba, Hidetoshi, 4,578,087, Cl. 51-295.000.
Yamada, Tetsusyo; and Hirate, Shintaro, 4,578,171, Cl. 204-406.000.
Nguyen, Harry V.: *See*—
Gionet, Daniel C.; and Nguyen, Harry V., 4,577,437, Cl. 49-25.000.
Nguyen, Tuan A., to Ball Corporation. Buckle resistance for metal container closures. 4,577,774, Cl. 220-66.000.
Nicholson, L. Todd: *See*—
Mayer, John F.; Langdon, Nick H.; Cook, Stuart A.; Nicholson, L. Todd; and Belcher, John R., 4,578,045, Cl. 446-330.000.
Nicol, David A.: *See*—
Clark, Harold R.; and Nicol, David A., 4,578,101, Cl. 65-109.000.
Nicolet Instrument Corporation: *See*—
Gordon, James F., 4,578,683, Cl. 346-49.000.
Niedermayer, Eleonora: *See*—
Csizer, Zoltan; Sikos, Karoly; Bacskai, Laszlo; Joo, Istvan; Niedermayer, Eleonora; Rethy, Lajos; and Zsidai, Jozsef, 4,578,270, Cl. 424-92.000.
Niikura, Yasuhiro; Morimoto, Yoshiro; Hamada, Hideo; Suga, Masaaki; and Murasugi, Takashi, to Nissan Motor Co., Ltd. Lock-up torque converter and method for controlling clutch slip in lock-up torque converter. 4,577,737, Cl. 192-0.032.
Nike, Inc.: *See*—
Frederick, Edward C., 4,578,769, Cl. 364-565.000.
Niki, Akira; and Iwasaki, Hirofumi, to Asahi Kasei Kogyo Kabushiki Kaisha. Nonwoven sheet having improved heat deterioration resistance and high elongation. 4,578,307, Cl. 428-288.000.
Niki, Hazime: *See*—
Oguro, Tadayuki; Yoshimoto, Teturo; and Niki, Hazime, 4,577,733, Cl. 188-217.000.
Nikki Co., Ltd.: *See*—
Marukawa, Toshio; Nakao, Haruki; and Mikiya, Toshio, 4,577,626, Cl. 128-64.000.
Nilsson, Kent: *See*—
Lindstrom, Lars; and Nilsson, Kent, 4,578,562, Cl. 219-125.100.
Nippe, Burkhard: *See*—
Greiner, Joachim; and Nippe, Burkhard, 4,578,280, Cl. 427-47.000.
Nippon Kokan Kabushiki Kaisha: *See*—
Kizaki, Kanji; Ishii, Hajime; Taguchi, Noboru; and Kuwamoto, Hiroshi, 4,577,480, Cl. 72-8.000.
Wakabayashi, Senzo, 4,577,785, Cl. 222-598.000.
Nippon Notion Kogyo Co., Ltd.: *See*—
Kasai, Kazumi, 4,577,377, Cl. 24-625.000.
Nippon Oil and Fats Company Limited: *See*—
Kuroyama, Yutaka; and Araki, Masatada, 4,578,260, Cl. 423-446.000.
Nippon Paint Co., Ltd.: *See*—
Umemoto, Hirotoshi; Tanabe, Hisaki; Kanakura, Akihiro; and Nakano, Shinji, 4,578,436, Cl. 525-443.000.
Nippon Piston Ring Co., Ltd.: *See*—
Nakamura, Keiji, 4,578,317, Cl. 428-547.000.
Nippon Rotary Nozzle Co., Ltd.: *See*—
Wakabayashi, Senzo, 4,577,785, Cl. 222-598.000.
Nippon Seiko Kabushiki Kaisha: *See*—
Saito, Naoki, 4,577,715, Cl. 180-79.100.
Nippon Steel Corporation: *See*—
Kanamaru, Tatsuya; Nakayama, Motohiro; Ogawa, Yutaka; and Arai, Katutoshi A., 4,578,158, Cl. 204-44.200.
Nippon Telephone & Telegraph Public Corporation: *See*—
Murakami, Toshiaki; Enomoto, Yoichi; and Suzuki, Minoru, 4,578,691, Cl. 357-5.000.
Nippon Zeon Co., Ltd.: *See*—
Joh, Yasushi, 4,578,077, Cl. 623-3.000.
Nippondenso Co., Ltd.: *See*—
Sogabe, Ichita, 4,577,832, Cl. 251-129.110.
Nirasawa, Mitsuharu: *See*—
Seshimoto, Osamu; and Nirasawa, Mitsuharu, 4,578,173, Cl. 204-416.000.
Nishida, Susumu; Kimura, Seiji; Kobayashi, Akio; and Fuchigami, Tadashi, to Sanyo Electric Co., Ltd. Refrigerator cabinet. 4,577,915, Cl. 312-214.000.

Nishikawa, Motoaki: *See*—
Kiyoto, Sumio; Nishikawa, Motoaki; Iwami, Morita; Terano, Hiroshi; and Kohsaka, Masanobu, 4,578,271, Cl. 424-117.000.
Nishino, Hiroshi; and Aibe, Toshio, to Takeda Chemical Industries, Ltd. Process for removal of poisonous gases. 4,578,256, Cl. 423-210.000.
Nishino, Keigo: *See*—
Irikura, Tsutomu; Nishino, Keigo; Suzue, Seigo; and Ikeda, Toshiya, 4,578,392, Cl. 514-300.000.
Nishio, Shigeru, to Aisin Seiki Kabushiki Kaisha. Control valve device. 4,577,607, Cl. 123-516.000.
Nishizawa, Akira: *See*—
Hirai, Seiichi; Nishizawa, Akira; and Otsuka, Nobuyuki, 4,578,048, Cl. 464-111.000.
Nissan Motor Company, Limited: *See*—
Hara, Yoichi; and Seimiya, Yasuo, 4,577,604, Cl. 123-397.000.
Hayashi, Yoshimasa; Kubozuka, Takao; and Hirano, Yoshinori, 4,577,594, Cl. 123-41.080.
Kanamori, Hiroshi, 4,578,292, Cl. 428-31.000.
Matsui, Yukio; and Uchiyama, Mitsuo, 4,578,164, Cl. 204-129.550.
Niikura, Yasuhiro; Morimoto, Yoshiro; Hamada, Hideo; Suga, Masaaki; and Murasugi, Takashi, 4,577,737, Cl. 192-0.032.
Seki, Shojiro, 4,577,439, Cl. 49-352.000.
Nisshin Spinning Co., Ltd.: *See*—
Oguro, Tadayuki; Yoshimoto, Teturo; and Niki, Hazime, 4,577,733, Cl. 188-217.000.
Nitto Kagaku Kogyu Kabushiki Kaisha: *See*—
Ashina, Yoshiro; Fujita, Takeyuki; Fukatsu, Michio; and Yagi, Junsuke, 4,578,516, Cl. 564-479.000.
Nitzsche, Raymond P.; and Geiger, Kenneth E., to Becton, Dickinson and Co. Reusable breach loading target pressure activated lancet firing device. 4,577,630, Cl. 128-314.000.
NL Industries, Inc.: *See*—
Pober, Kenneth W., 4,578,456, Cl. 530-502.000.
NL Petroleum Products Limited: *See*—
Barr, John D., 4,577,706, Cl. 175-329.000.
Noda, Sakuo: *See*—
Takita, Hitoshi; Noda, Sakuo; Mukaida, Yutaka; and Kobayashi, Hidetoshi, 4,578,404, Cl. 514-567.000.
Noda, Shinji: *See*—
Tanaka, Yasunori; and Noda, Shinji, 4,577,362, Cl. 15-256.500.
Noguchi, Masaru, to Fuji Photo Film Co., Ltd. Light beam scanning device. 4,578,577, Cl. 250-235.000.
Nomura, Kazuhiko; Kazuta, Hisashi; and Kimura, Hiroshi, to Yamaha Hatsudoki Kabushiki Kaisha. Motorcycle fuel system with flow from a main tank through a lower auxiliary tank to its engine. 4,577,719, Cl. 180-219.000.
Norchem, Inc.: *See*—
Pullukat, Thomas J.; and Hoff, Raymond E., 4,578,440, Cl. 526-128.000.
Nordica S.p.A.: *See*—
Sartor, Mariano, 4,577,421, Cl. 36-119.000.
Nordlof, Richard D. Stock advancing apparatus with dancer operated potentiometer speed control. 4,578,621, Cl. 318-6.000.
Noristan Limited: *See*—
Fourie, Theunis G.; Dekker, Theodor G.; Snyckers, Friedrich O.; and van der Schyf, Cornelis J., 4,578,520, Cl. 568-315.000.
Northern Telecom Limited: *See*—
Garner, John N., 4,577,403, Cl. 29-872.000.
Northwestern University: *See*—
Goldberg, Erwin; and Wheat, Thomas E., 4,578,219, Cl. 260-112.50R.
Norton Christensen, Inc.: *See*—
Aumann, James T., 4,577,704, Cl. 175-107.000.
Norton, Peter. Servo steering system. 4,577,716, Cl. 180-79.100.
Notari, Bruno: *See*—
Buonomo, Franco; Bellussi, Giuseppe; and Notari, Bruno, 4,578,161, Cl. 204-102.000.
Noyori, Ryoji; Suzuki, Masaaki; Yanagisawa, Akira; and Kurozumi, Seizi, to Teijin Limited. Process for preparing prostacyclins. 4,578,482, Cl. 549-214.000.
Nozoe, Toshiro: *See*—
Miki, Yutaka; Nozoe, Toshiro; and Uchimura, Kiyoshi, 4,578,698, Cl. 358-22.000.
Nuerrenbach, Axel: *See*—
Frickel, Fritz-Frieder; and Nuerrenbach, Axel, 4,578,498, Cl. 560-8.000.
Numa Corporation: *See*—
Williams, Richard E., 4,578,571, Cl. 235-472.000.
Nunn, John O., Jr.; and Nunn, John O., Sr. Refrigeration system with refrigerant pre-cooler. 4,577,468, Cl. 62-113.000.
Nunn, John O., Sr.: *See*—
Nunn, John O., Jr.; and Nunn, John O., Sr., 4,577,468, Cl. 62-113.000.
Nusbaumer, Kay T.; and McIntosh, Bruce D., to PHD, Inc. Gripper apparatus. 4,577,898, Cl. 294-88.000.
O.M.C. s.n.c. di Walter & Dante Cavalli: *See*—
Cavalli, Walter, 4,577,532, Cl. 74-841.000.
Occelli, Luciano. Method and device for mixing under vacuum mixtures used in dental, goldsmith fields or the like. 4,577,973, Cl. 366-139.000.
Ochs, Charles S.; and Siler, Harold L., to Anchor Hocking Corporation. Air conveying hopper. 4,578,001, Cl. 406-10.000.
O'Connor, James J., to Kimberly-Clark Corporation. Incontinent garment, catamenial device or wound dressing. 4,578,066, Cl. 604-366.000.
Odagiri, Masaru: *See*—
Suzuki, Takashi; Fujimori, Hiroshi; and Odagiri, Masaru, 4,578,729, Cl. 360-134.000.
Ode, Bengt: *See*—
Borrman, Bo; Heilman, Erik; Lundin, Nils; and Ode, Bengt, 4,578,241, Cl. 376-446.000.
O'Driscoll, Peter F., to United States of America, Air Force. Dome restraint assembly for rocket motors. 4,577,542, Cl. 86-20.00D.
Oesterle, Hermann F.: *See*—
Gunther, Horst H.; and Oesterle, Hermann F., 4,578,547, Cl. 200-11.0DA.
Oesterle, Kurt M. Device for performing micromechanical measurements of the surface of test objects. 4,577,493, Cl. 73-81.000.
Officine Savio S.p.A.: *See*—
Speranzin, Claudio; Badiali, Roberto; and Bertoli, Luciano, 4,577,459, Cl. 57-22.000.
Ogasawara, Takayuki: *See*—
Morita, Tetuya; Wakasa, Akinori; Ogawa, Yutaka; and Ogasawara, Takayuki, 4,577,600, Cl. 123-270.000.
Ogata, Hiroshi: *See*—
Imai, Kazuhiro; Ogata, Hiroshi; Tanaka, Motoaki; Nawa, Hiroyoshi; and Ishihara, Masami, 4,578,499, Cl. 560-21.000.
Ogawa, Junji; Nakano, Tomio; Nakano, Masao; Tsuge, Norihisa; and Horii, Takashi, to Fujitsu Limited. MIS transistor circuit. 4,578,781, Cl. 365-203.000.
Ogawa, Yutaka: *See*—
Kanamaru, Tatsuya; Nakayama, Motohiro; Ogawa, Yutaka; and Arai, Katutoshi A., 4,578,158, Cl. 204-44.200.
Morita, Tetuya; Wakasa, Akinori; Ogawa, Yutaka; and Ogasawara, Takayuki, 4,577,600, Cl. 123-270.000.
Oguro, Tadayuki; Yoshimoto, Teturo; and Niki, Hazime, to Nisshin Spinning Co., Ltd.; and Sumitomo Heavy Industries Ltd. Drum brake or clutch. 4,577,733, Cl. 188-217.000.
O'Hara, Almerin C., Jr., to International Business Machines Corporation. Dynamically reprogrammable array logic system. 4,578,771, Cl. 364-716.000.
Ohba, Shinya: *See*—
Ozawa, Naoki; Akiyama, Toshiyuki; Nagahara, Shuusaku; Ohba, Shinya; Ando, Haruhisa; and Ozaki, Toshifumi, 4,578,707, Cl. 358-212.000.
Ohba, Yasuhiro: *See*—
Nagano, Hiroyuki; Takagi, Mitiro; Kubodera, Noboru; Matsunaga, Isao; Nabata, Hiroyuki; Ohba, Yasuhiro; Sakai, Kazushige; Hata, Shun-ichi; and Uchida, Yasumi, 4,578,465, Cl. 544-285.000.
Ohigashi, Hiroji; Koga, Keiko; and Nakanishi, Toshiharu, to Toray Industries, Inc. Piezoelectric polymeric material, a process for producing the same and an ultrasonic transducer utilizing the same. 4,578,442, Cl. 526-255.000.
Ohmura, Tadayoshi: *See*—
Kawata, Hiroitsu; Ohmura, Tadayoshi; Hasumi, Shunji; Konno, Yutaka; Aruga, Masayoshi; Tashiro, Seiki; Konno, Toshimitsu; and Iwai, Ken, 4,578,391, Cl. 514-256.000.
Ohnishi, Haruo; Yamaguchi, Kazuo; Suzuki, Yasuo; and Mochida, Nobuo, to Mochida Pharmaceutical Co., Ltd. Therapeutic composition and method for treatment of cardiovascular diseases. 4,578,400, Cl. 514-460.000.
Ohno, Kouzin, to Takara Co., Ltd. Reversibly transformable toy block assembly. 4,578,046, Cl. 446-376.000.
Ohno, Shigeru; Kishimoto, Shinzo; Ikegawa, Akihiko; and Yagihara, Morio, to Fuji Photo Film Co., Ltd. Method for processing color photographic light-sensitive material. 4,578,345, Cl. 430-393.000.
Ohta, Hiroshi; Abe, Shinji; and Fukushima, Kiyoto, to TDK Corporation. Magnetic recording medium and method for manufacture thereof. 4,578,314, Cl. 428-403.000.
Ohtsu, Takaji: *See*—
Soneda, Mitsuo; Fukuzawa, Manami; and Ohtsu, Takaji, 4,578,597, Cl. 307-265.000.
Oil Process Systems, Inc.: *See*—
Friedman, Bernard, 4,578,196, Cl. 210-765.000.
Oil Rite Corporation: *See*—
Gruett, Donald G., 4,577,728, Cl. 184-7.400.
Oiles Industry Co., Ltd.: *See*—
Kitta, Toshiyuki; Abe, Wataru; and Takase, Tadaaki, 4,577,443, Cl. 52-230.000.
Oka, Tateki, to Minolta Camera Kabushiki Kaisha. Dry process for developing electrostatic latent images with a developer comprising two kinds of magnetic carriers having different physical structure. 4,578,337, Cl. 430-107.000.
Okada, Keiko: *See*—
Furukawa, Hisao; Okada, Keiko; Kawamura, Joe; and Kato, Yasushi, 4,578,417, Cl. 524-378.000.
Okahashi, Kazuo: *See*—
Takahashi, Ichiro; Okamoto, Goro; and Okahashi, Kazuo, 4,577,664, Cl. 138-149.000.
Okamiya, Yoshiaki: *See*—
Yamaguchi, Hisao; Kanno, Hideo; Okamiya, Yoshiaki; and Sunakawa, Kiyotaka, 4,578,395, Cl. 514-356.000.
Okamoto, Goro: *See*—
Takahashi, Ichiro; Okamoto, Goro; and Okahashi, Kazuo, 4,577,664, Cl. 138-149.000.
Okanobu, Taiwa, to Sony Corporation. FM stereo multiplex demodulator. 4,578,807, Cl. 381-7.000.
Okazaki, Nobuo: *See*—
Nakazawa, Takaaki; Kazaoka, Kenichi; Okazaki, Nobuo; and Nakashima, Kunihiko, 4,578,592, Cl. 307-10.00R.

Okita, Tsutomu: *See—*
Kato, Mikihiko; Okita, Tsutomu; Komine, Shigeo; Okuzawa, Yasutoshi; and Morita, Kazuhiko, 4,578,299, Cl. 428-65.000.
Oksman, Norman H.; Talmage, Joseph M.; and Wells, Henry J., to Warner-Lambert Company. Collection of specimens and detection of occult blood therein. 4,578,358, Cl. 436-66.000.
Oksman, Norman H.; Talmage, Joseph M.; and Wells, Henry J., to Warner-Lambert Company. Occult-blood detection. 4,578,359, Cl. 436-66.000.
Okugawa, Yoshio, to Hiraoka Kogyo Kabushiki Kaisha. Apparatus for holding unoperating needle bar of braiding machine. 4,577,569, Cl. 112-83.000.
Okumura, Takeo: *See—*
Fujii, Kozo; and Okumura, Takeo, 4,578,216, Cl. 252-542.000.
Okuno, Takuo, to Canon Kabushiki Kaisha. Light beam printer. 4,578,688, Cl. 346-157.000.
Okura, Eiji, to Diesel Kiki Co., Ltd. Device for detecting overcharge of refrigerant in air conditioner for automobiles. 4,577,469, Cl. 62-126.000.
Okura, Zenichi: *See—*
Urano, Fumio; Okura, Zenichi; and Kawasaki, Masahiro, 4,577,952, Cl. 354-455.000.
Okuzawa, Yasutoshi: *See—*
Kato, Mikihiko; Okita, Tsutomu; Komine, Shigeo; Okuzawa, Yasutoshi; and Morita, Kazuhiko, 4,578,299, Cl. 428-65.000.
Oliff, James R., to Mead Corporation, The. Panel interlocking means. 4,577,799, Cl. 229-40.000.
Olin Corporation: *See—*
Mahulikar, Deepak; and Shapiro, Eugene, 4,578,320, Cl. 428-674.000.
Miles, Ronald C.; Justice, David D.; and Dotson, Ronald L., 4,578,159, Cl. 204-98.000.
Moore, Sanders H.; Smith, Maurice R.; and Cochran, Harvey B., 4,578,195, Cl. 210-679.000.
Watson, William G., 4,577,676, Cl. 164-468.000.
Winter, Joseph; and Pryor, Michael J., 4,577,925, Cl. 350-96.230.
Oliva, Ambro: *See—*
Bosteels, Michel; and Oliva, Ambro, 4,577,658, Cl. 137-599.000.
Oliver, Colin C., to EMI Limited. Radiography. 4,578,801, Cl. 378-19.000.
Oliver, John P. Downstream sealing device. 4,577,834, Cl. 251-175.000.
Oliver, Stewart W.; and Cosgrove, John, to International Teldata Corp. Centerpoint automatic meter reading system. 4,578,536, Cl. 179-2.0AM.
Olsen, Donald A.; and Eacobacci, Michael J., to Helix Technology Corporation. Oil free vacuum system. 4,577,465, Cl. 62-55.500.
Olshausen, Michael C. Accessory lock and article storage device for bicycles and the like. 4,577,477, Cl. 70-58.000.
Olsson, Karl-Erik, to ASEA AB. Semiconductor valve. 4,578,745, Cl. 363-68.000.
Olympus Optical Co., Ltd.: *See—*
Toda, Akitoshi; and Mimura, Yoshiyuki, 4,578,332, Cl. 430-55.000.
Omae, Yoshihiro; Ishikawa, Kunio; Fukao, Takahisa; and Yoshida, Katsushige, to Mitsubishi Chemical Industries, Ltd. Method and apparatus for repairing a wall of coke oven. 4,577,385, Cl. 29-402.180.
OMI International Corporation: *See—*
Crotty, David E., 4,578,122, Cl. 148-6.200.
Omure, Yukio: *See—*
Hisamoto, Iwao; and Omure, Yukio, 4,578,209, Cl. 252-143.000.
Ona, Isao: *See—*
Kakinoki, Hideo; and Ona, Isao, 4,578,084, Cl. 8-115.610.
Onopchenko, Anatoli; and Sabourin, Edward T., to Gulf Research & Development Company. Tetraalkylsilane synthetic fluids. 4,578,497, Cl. 556-479.000.
Oota, Makoto; Nekozuka, Masamichi; and Yagishita, Kikuji, to Mitsubishi Denki Kabushiki Kaisha. Color liquid crystal display device. 4,578,672, Cl. 340-702.000.
Optical Coating Laboratory, Inc.: *See—*
Rancourt, James D.; and Beauchamp, William T., 4,578,527, Cl. 136-256.000.
Optical Systems International, Inc.: *See—*
Frieder, Philip M.; and de Rojas, Edward, 4,577,942, Cl. 351-159.000.
Opto Systems, Inc.: *See—*
Wheeler, Jay A.; and Willmore, James A., 4,578,576, Cl. 250-214.00A.
Orazi, Paul. Wing assemblies for aircraft. 4,577,815, Cl. 244-39.000.
ORC Manufacturing Co., Ltd.: *See—*
Yazaki, Yoshio, 4,577,959, Cl. 355-67.000.
O'Rear, Jacques G.: *See—*
Griffith, James R.; and O'Rear, Jacques G., 4,578,508, Cl. 560-221.000.
Ortho Diagnostics, Inc.: *See—*
Hansen, William P., Jr., 4,577,964, Cl. 356-39.000.
Ortwein, Hermann, to Clouth Summiwerke Aktiengesellschaft. Elastomeric mounting for railway rail with differently angled flanks. 4,577,801, Cl. 238-283.000.
Osborn, Jeffrey G.: *See—*
Everhart, Joseph R.; and Osborn, Jeffrey G., 4,578,531, Cl. 178-22.080.
Oscar Mayer Foods Corporation: *See—*
Hustad, Gerald O.; Griesbach, Ray H.; and Anderson, James, 4,577,757, Cl. 206-461.000.
Oshefsky, Daniel J.; Gavronski, Paul A.; Vogt, Robert E.; and Rajala, Gregory J., to Kimberly-Clark Corporation. Method and apparatus for applying discrete strips to a web of material. 4,578,133, Cl. 156-164.000.
Oswald, Max R.: *See—*
McIntyre, James A.; Phillips, Robert F.; and Oswald, Max R., 4,578,162, Cl. 204-107.000.
Otsu, Shimpei: *See—*
Shimizu, Keizo; Otsu, Shimpei; Fujimura, Toshio; Taniguchi, Yoshisada; and Nagami, Hayashi, 4,578,787, Cl. 369-77.200.
Otsuka Kagaku Kabushiki Kaisha: *See—*
Imai, Tetsuya, 4,578,107, Cl. 71-92.000.
Otsuka, Nobuyuki: *See—*
Hirai, Seiichi; Nishizawa, Akira; and Otsuka, Nobuyuki, 4,578,048, Cl. 464-111.000.
Otsuka Pharmaceutical Co., Ltd.: *See—*
Uchida, Minoru; Komastu, Makoto; and Nakagawa, Kazuyuki, 4,578,381, Cl. 514-233.000.
Ott-A-Matic, Inc.: *See—*
Ott, Kenneth A., 4,577,399, Cl. 29-733.000.
Ott, Kenneth A., to Ott-A-Matic, Inc. Commutator placing machine. 4,577,399, Cl. 29-733.000.
Otteson, Kenneth M.: *See—*
Dawson, Daniel J.; and Otteson, Kenneth M., 4,578,515, Cl. 564-215.000.
Ouchi, Isao; and Yusa, Hideo, to Kureha Kagaku Kogyo Kabushiki Kaisha. Heat-resistant laminates. 4,578,294, Cl. 428-35.000.
Outboard Marine Corporation: *See—*
Donohue, James A., 4,577,609, Cl. 123-602.000.
DuBois, Chester G.; and Flaig, John D., 4,577,608, Cl. 123-583.000.
Hall, Charles B., 4,578,039, Cl. 440-61.000.
Ovard, John C. Splash bar method and apparatus. 4,578,227, Cl. 261-111.000.
Owen, David J., to Imperial Chemical Industries PLC. Containers. 4,577,803, Cl. 239-690.000.
Owens-Corning Fiberglas Corporation: *See—*
Schuster, Gary B. A., 4,578,362, Cl. 501-17.000.
Owens-Illinois, Inc.: *See—*
Go, Santos W., deceased; and Jabarin, Saleh A., 4,577,768, Cl. 215-1.00C.
Jabarin, Saleh A., 4,578,295, Cl. 428-35.000.
Oy Wartsila AB: *See—*
Eriksson, Runar, 4,577,577, Cl. 114-120.000.
Lindqvist, Gustav; and Juurmaa, Kimmo, 4,578,000, Cl. 405-211.000.
Ozaki, Toshifumi: *See—*
Ozawa, Naoki; Akiyama, Toshiyuki; Nagahara, Shuusaku; Ohba, Shinya; Ando, Haruhisa; and Ozaki, Toshifumi, 4,578,707, Cl. 358-212.000.
Ozawa, Naoki; Akiyama, Toshiyuki; Nagahara, Shuusaku; Ohba, Shinya; Ando, Haruhisa; and Ozaki, Toshifumi, to Hitachi, Ltd. Method of reducing vertical smears of a solid state image sensor. 4,578,707, Cl. 358-212.000.
P. D. George Co., The: *See—*
Biorcio, Luciano; and Mensi, Carlo, 4,578,312, Cl. 428-336.000.
P. L. Porter Company: *See—*
Porter, Clyde R., 4,577,730, Cl. 188-67.000.
PA Incorporated: *See—*
Moake, Gordon L.; and Milewits, Marvin, 4,578,642, Cl. 324-160.000.
Paek, Un C.; and Schroeder, Charles M., to AT&T Technologies, Inc. Apparatus for controlling lightguide fiber tension during drawing. 4,578,098, Cl. 65-13.000.
Pagliaro, Robert H., Jr.: *See—*
Corboy, John F., Jr.; Jastrzebski, Lubomir L.; Blackstone, Scott C.; and Pagliaro, Robert H., Jr., 4,578,142, Cl. 156-612.000.
Paillart, Philippe: *See—*
Seigneur, Emile; and Paillart, Philippe, 4,577,916, Cl. 312-257.00R.
Pandeya, Prakash N.; and Chu, Tsuwei, to Carrier Corporation. Reversible rotating vane rotary compressor having a movable supplemental suction port. 4,577,472, Cl. 62-324.600.
Panster, Peter; and Kleinschmit, Peter, to Degussa Aktiengesellschaft. Polymeric metal-amine complex compounds, processes for their preparation and use. 4,578,496, Cl. 556-479.000.
Pantani, Jean-Pierre: *See—*
Delaporte, Francois-Xavier; Lebesnerais, Gerard M.; and Pantani, Jean-Pierre, 4,578,695, Cl. 357-48.000.
Parente, Robert F.: *See—*
Mee, John L.; and Parente, Robert F., 4,578,635, Cl. 324-62.000.
Parker-Hannifin Corporation: *See—*
Moreiras, Luis, 4,577,485, Cl. 72-402.000.
Parker, Robert R.; and Rattan, Dev R., to Bell & Howell Company. Control arrangement and method for video tape recorder. 4,578,718, Cl. 360-10.300.
Parl, Fritz F.: *See—*
Bradley, Charles A.; Benge, Herman; Parl, Fritz F.; and Seebaugh, William R., 4,577,514, Cl. 73-863.010.
Pascucci, Gregory A.; and Kucharski, Paul G., to Johnson Service Company. Method and apparatus for communicating digital signals over telephone lines. 4,578,538, Cl. 179-2.0DP.
Pastor, Ricardo C.; and Robinson, Morton, to Hughes Aircraft Company. Method for preparing ultra-pure zirconium and hafnium tetrafluorides. 4,578,252, Cl. 423-76.000.
Pate, Harold T.: *See—*
Borsh, Richard J.; Ripley, Robert W.; and Pate, Harold T., 4,578,528, Cl. 174-65.00G.
Patel, Jayendrakumar I. Endoscope having novel proximate and distal portions. 4,577,621, Cl. 128-4.000.

Patenver AG: *See*—
Frei, Peter, 4,577,727, Cl. 182-128.000.
Patton, Larry. Hydromassage and whirlpool bath. 4,577,624, Cl. 128-40.000.
Pautz, Brigitte: *See*—
Siedel, Joachim; Neumann, Ulrich; Ziegenhorn, Joachim; Batz, Hans-Georg; Lenz, Helmut; Pautz, Brigitte; and Albert, Winfried, 4,578,361, Cl. 436-547.000.
Peabody Myers Corporation: *See*—
Schmidt, Ronald L.; and Shaddock, Roland E., 4,578,198, Cl. 210-780.000.
Pearlman, Jay S.; and Shannon, John P., to Maxwell Laboratories, Inc. Transmission line transmitting energy to load in vacuum chamber. 4,578,805, Cl. 378-119.000.
Pecheux, Jean C., to Compagnie Generale de Materiel Orthopedique. Splint mobilizing an upper limb. 4,577,623, Cl. 128-25.00R.
Peehs, Martin: *See*—
Assmann, Helmut; Dichtjar, Gerhard; Dorr, Wolfgang; Maier, Georg; Mathieu, Viktor; and Peehs, Martin, 4,578,229, Cl. 264-0.500.
Peel, John D.; and Knight, Paul A., to Beloit Corporation. Cyclone separators. 4,578,199, Cl. 210-788.000.
Peel, John L., to National Semiconductor Corporation. Reduction of field oxide encroachment in MOS fabrication. 4,577,394, Cl. 29-576.00W.
Pejsa, Jane H., to Honeywell Inc. Energy submetering system. 4,577,977, Cl. 374-39.000.
Pellegrino, Thomas P., to Molex Incorporated. Connector polarization method. 4,577,404, Cl. 29-874.000.
Pellico, Michael A.; and Montgomery, Robert E., to Laclede Professional Products, Inc. Di-enzymatic dentifrice. 4,578,265, Cl. 424-50.000.
Pellkofer, Dieter: *See*—
Forner, Siegfried; Langhammer, Karl-Heinz; Pellkofer, Dieter; and Nahr, Wolfgang, 4,577,795, Cl. 228-29.000.
Pelloux-Gervais, Pierre: *See*—
Faudou, Jean-Yves; and Pelloux-Gervais, Pierre, 4,577,386, Cl. 29-455.00R.
Peloggio, Alessandro, to Exacta S.p.A. Precision-stitch sewing machine. 4,577,573, Cl. 112-318.000.
Penn Engineering & Manufacturing Corp.: *See*—
Swanstrom, Kenneth A., 4,577,402, Cl. 29-840.000.
Pentith, Gerald R. O., to Continental Conveyor & Equipment Co., Inc. Frictional drive means and method for driving frictional rollers. 4,577,749, Cl. 198-805.000.
Perkin-Elmer Corporation, The: *See*—
Wu, Frederick Y., 4,578,590, Cl. 250-548.000.
Permelec Electrode Ltd.: *See*—
Asano, Hiroshi; Shimamune, Takayuki; and Hirao, Kazuhiro, 4,578,160, Cl. 204-98.000.
Perrin, David P.: *See*—
Siemers, Paul A.; Kopp, Robert W.; Jackson, Melvin R.; Duke, Steven R.; Perrin, David P.; and Liu, Ying H., 4,577,431, Cl. 42-76.00A.
Perry, John W., to BEI Electronics, Inc. Digital time fuze method and apparatus. 4,577,561, Cl. 102-215.000.
Persinotti, Gary W., to Motorola, Inc. Wide area coverage radio communication system and method. 4,578,815, Cl. 455-15.000.
Personal Diagnostics, Inc.: *See*—
Meserol, Peter M., 4,577,970, Cl. 356-440.000.
Personal Products Company: *See*—
Holtman, Dennis C., 4,578,070, Cl. 604-378.000.
Peterson, David R., to Advanced Micro Devices, Inc. Fabrication technique for integrated circuits. 4,577,392, Cl. 29-571.000.
Peterson, Steven H.; and Jackovitz, John F., to Westinghouse Electric Corp. Process for separation of zirconium from hafnium. 4,578,165, Cl. 204-157.750.
Peterson, Walter E. Thermally insulated holder for a single beverage can. 4,577,474, Cl. 62-457.000.
Petig Corporation: *See*—
Diesner, Willi, 4,577,665, Cl. 139-431.000.
Petit, Raymond, to Guery S.A. Device for discharging pulverulent products contained in a silo. 4,578,012, Cl. 414-310.000.
Petrini, Roland; Pradier, Serge; and Mabboux, Michel, to Salomon S.A. Ski boot. 4,577,420, Cl. 36-117.000.
Petroff, Pierre M.: *See*—
Gossard, Arthur C.; Miller, Robert C.; and Petroff, Pierre M., 4,578,127, Cl. 148-175.000.
Petrolite Corporation: *See*—
Quinlan, Patrick M., 4,578,243, Cl. 422-7.000.
Peyre, Henri: *See*—
Bardin, Roland; Bernard, Jean; Peyre, Henri; and Viodet, Patrice, 4,577,887, Cl. 280-628.000.
Pfeuffer, Donald F.: *See*—
Mayer, Edward F.; and Pfeuffer, Donald F., 4,577,955, Cl. 355-15.000.
Pfister GmbH: *See*—
Hafner, Hans W., 4,577,519, Cl. 74-5.00F.
Pfizer Inc.: *See*—
Cannon, John J., 4,578,354, Cl. 435-178.000.
Pharmacontrol Corp.: *See*—
Cosgrove, Robert J., Jr.; and Smolen, Victor F., 4,578,244, Cl. 422-65.000.
PHD, Inc.: *See*—
Nusbaumer, Kay T.; and McIntosh, Bruce D., 4,577,898, Cl. 294-88.000.
Philip, James B., Jr., to Minnesota Mining and Manufacturing Company. Supersensitization of silver halide emulsions. 4,578,347, Cl. 430-572.000.
Philip Morris Incorporated: *See*—
Podraza, Kenneth F., 4,578,486, Cl. 549-379.000.
Philipson, Joseph: *See*—
Hall, Charles P.; and Philipson, Joseph, 4,577,357, Cl. 5-451.000.
Phillipps, Gordon H.; Bain, Brian M.; and Laing, Stuart B., to Glaxo Group Limited. Androstane carbothioic acids. 4,578,221, Cl. 260-397.100.
Phillips, Edward H., to Eaton-Optimetrix, Inc. Bore-sighted step-and-repeat projection alignment and exposure system. 4,577,957, Cl. 355-43.000.
Phillips, Edward H., to Eaton Optimetrix, Inc. Bore-sighted step-and-repeat projection alignment and exposure system. 4,577,958, Cl. 355-43.000.
Phillips, Mark R. Convertible utility chair. 4,577,901, Cl. 297-17.000.
Phillips Petroleum Company: *See*—
Albers, Lloyd R., 4,578,152, Cl. 203-1.000.
Burns, Lyle D.; and Stahl, G. Allan, 4,578,201, Cl. 252-8.55C.
Ezzell, Robert C., 4,577,677, Cl. 165-1.000.
Holba, Albert G.; Doe, Susanne B.; and Hughes, William B., 4,577,492, Cl. 73-61.10C.
Kukes, Simon G.; Johnson, Marvin M.; Strope, Daniel J.; and Hogan, Robert J., 4,578,179, Cl. 208-110.000.
Kukes, Simon G.; Hogan, Robert J.; Coombs, Daniel M.; and Strope, Daniel J., 4,578,180, Cl. 208-110.000.
McKee, Joseph M.; and Horton, Robert L., 4,577,908, Cl. 299-2.000.
Soderstrom, Edwin D., III; and Davis, Terrence A., 4,578,151, Cl. 203-1.000.
Phillips, Robert F.: *See*—
McIntyre, James A.; Phillips, Robert F.; and Oswald, Max R., 4,578,162, Cl. 204-107.000.
Phillipson, Walter M., to Stewart Stamping Corp. Contact and terminal for telephone transmitter. 4,578,545, Cl. 179-178.000.
Phipps, Robert E.: *See*—
Mooney, Charles W.; Phipps, Robert E.; and Kuznicki, William J., 4,577,735, Cl. 188-268.000.
Piehl, James R.: *See*—
Quinn, Robert O.; Govekar, Craig F.; and Piehl, James R., 4,578,755, Cl. 364-431.010.
Pieper, Henner: *See*—
Seitz, Hans; Pieper, Henner; Frerichs, Udo; and Rach, Heinz-Dieter, 4,577,668, Cl. 152-520.000.
Pier, Gerald B., to Brigham and Women's Hospital. Mucoid exopolysaccharide vaccine against *Pseudomonas aeruginosa*. 4,578,458, Cl. 536-123.000.
Pierce, O. Leon, to Universal Data Systems, Inc. Switchable line powered modem. 4,578,533, Cl. 179-2.0DP.
Pierschbacher, Michael: *See*—
Ruoslahti, Erkki; and Pierschbacher, Michael, 4,578,079, Cl. 623-11.000.
Pillac, Bernard: *See*—
Morel, Michel; and Pillac, Bernard, 4,577,484, Cl. 72-245.000.
Pinckney Molded Plastics, Inc.: *See*—
Kreeger, Elsmer W., 4,577,759, Cl. 206-505.000.
Pines, Seemon H.: *See*—
Dolling, Ulf H.; Pines, Seemon H.; and Grabowski, Edward J. J., 4,578,509, Cl. 562-462.000.
Pinson, George T., to Boeing Company, The. Ocular pointing and tracking device. 4,577,825, Cl. 248-550.000.
Pioneer Electronic Corporation: *See*—
Hasegawa, Shinichi, 4,578,710, Cl. 358-231.000.
Piper, Francis R.: *See*—
Bray, David J.; Johnson, Peter E.; Marshall, Peter E. G.; Piper, Francis R.; and Murdoch, Iain H., 4,577,490, Cl. 73-40.700.
Marshall, Peter E. G.; Piper, Francis R.; and Wilson, John F., 4,577,489, Cl. 73-40.700.
Pipper, Gunter; Riegger, Siegfried; and Floss, Josef G., to BASF Aktiengesellschaft. Process and apparatus for removing volatile constituents from polymer melts or pastes. 4,578,455, Cl. 528-501.000.
Pissot, Guy, to Thomson-Brandt. Station-selecting device for a radio receiver. 4,578,047, Cl. 464-30.000.
Pitney Bowes Inc.: *See*—
Chang, Mike S. H., 4,578,493, Cl. 556-451.000.
Muller, Arno, 4,578,758, Cl. 364-466.000.
Muller, Arno, 4,578,774, Cl. 364-900.000.
Placke, Dale L.; Filliman, Mark D.; Granzow, Robert H.; Gross, Jack R.; and Nagy, Charles S., to NCR Corporation. Cash dispensing system. 4,577,763, Cl. 209-534.000.
Placke, Dale L.: *See*—
Granzow, Robert H.; Daulton, Richard H.; Placke, Dale L.; Adelberger, Donald L.; Gross, Jack R.; and Nagy, Charles S., 4,578,009, Cl. 414-43.000.
Plasma Holdings, N.V.: *See*—
Mathiesen, Mait M., 4,577,838, Cl. 266-171.000.
Plasmafusion, Inc.: *See*—
Turner, Trueman D., 4,578,557, Cl. 219-121.0PP.
Platus, Daniel H., to United States of America, Air Force. Centrifugally operated moving-mass roll control system. 4,577,812, Cl. 244-3.210.
Plazter, Stephan J. W., to American Hoechst Corporation. Electrolytes for electrochemically treating metal plates. 4,578,156, Cl. 204-33.000.
Plessey Overseas Limited: *See*—
West, Leslie L., 4,578,808, Cl. 381-88.000.

Plummer, William B.: *See—*
Lovgren, Jeffrey L.; and Plummer, William B., 4,578,722, Cl. 360-60.000.
Plunkett, Allan B.: *See—*
Kliman, Gerald B.; and Plunkett, Allan B., 4,578,610, Cl. 310-156.000.
Pober, Kenneth W., to NL Industries, Inc. Ethoxylated lignite composition and method of preparing. 4,578,456, Cl. 530-502.000.
Podraza, Kenneth F., to Philip Morris Incorporated. Smoking compositions containing a dicarbonate ester flavorant-release additive. 4,578,486, Cl. 549-379.000.
Pokorny, Erich: *See—*
Lenard, Peter; Pokorny, Erich; and Bailer, Norbert, 4,577,533, Cl. 76-41.000.
Polaroid Corporation: *See—*
Viola, Michael S., 4,578,285, Cl. 427-209.000.
Polizzi, Emanuel V.: *See—*
Grass, Joseph J.; Glyzewski, Marvin P.; and Polizzi, Emanuel V., 4,578,806, Cl. 378-162.000.
Poly-John Enterprises Corp.: *See—*
Harding, George W., 4,577,351, Cl. 4-460.000.
Polyplastics Co., Ltd.: *See—*
Matsuoka, Masatoshi; Ikenaga, Yukio; and Matsuno, Osamu, 4,578,408, Cl. 524-91.000.
Poole, Michael J.; and Crook, Michael J., to United Kingdom Atomic Energy Authority. Ultrasonic scanning probe. 4,577,506, Cl. 73-633.000.
Pope, Adam N., to General Electric Company. Rotor thrust balancing. 4,578,018, Cl. 415-14.000.
Pope, Lonnie H. Apparatus for making soap. 4,578,246, Cl. 422-111.000.
Population Council, Inc., The: *See—*
Luukkainen, Tapani; and Liukkonen, Ahti M. K., 4,578,076, Cl. 604-892.000.
Porsfeld, Friedhelm. Pavement and masonry stone cutter. 4,577,613, Cl. 125-23.00C.
Porter, Clyde R., to P. L. Porter Company. Mechanical lock. 4,577,730, Cl. 188-67.000.
Postalia GmbH: *See—*
Muller, Wilhelm, 4,577,851, Cl. 271-33.000.
Posthuma de Boer, Abe; and Vegt, Jan W., to U.S. Philips Corporation. Diaphragm comprising at least one foil of a piezoelectric polymer material. 4,578,613, Cl. 310-800.000.
Postle, Stephen R.; and Kingston, Samuel B., to Ciba-Geigy AG. Photochromic assembly comprising photochromic glass beads in polymer latex. 4,578,305, Cl. 428-212.000.
Poules, Wadi: *See—*
Praefcke, Klaus; Kohne, Bernd; Poules, Wadi; Eidenschink, Rudolf; and Scheuble, Bernhard, 4,578,210, Cl. 252-299.600.
Pouliot, Thomas W.: *See—*
Bosch, Henery G. K.; and Pouliot, Thomas W., 4,577,592, Cl. 123-90.150.
Pountain, Melvin D.: *See—*
Swenson, Robert D., 4,577,360, Cl. 12-115.600.
Powers, Joseph E.; and Williamson, Calvin C., to Kaiser Steel Corporation. Method and apparatus for tracking seam welds on pipes and the like. 4,577,796, Cl. 228-102.000.
PPG Industries, Inc.: *See—*
Breininger, J. Shannon, 4,578,100, Cl. 65-60.800.
Franz, Helmut; Hanlon, James H.; and Shick, Lloyd G., 4,578,203, Cl. 252-49.300.
Pradier, Serge: *See—*
Petrini, Roland; Pradier, Serge; and Mabboux, Michel, 4,577,420, Cl. 36-117.000.
Praefcke, Klaus; Kohne, Bernd; Poules, Wadi; Eidenschink, Rudolf; and Scheuble, Bernhard, to Merck Patent Gesellschaft mit beschrankter Haftung. Carbocyclic six-membered ring compounds. 4,578,210, Cl. 252-299.600.
Pratt, Sandra L.; Lucas, Gary M.; and Zembayashi, Michio, to General Electric Company. Non-corrosive silicone RTV compositions. 4,578,492, Cl. 556-407.000.
Praus, Gerd: *See—*
Holdt, Bernd-Dieter; Menke, Ronald; Praus, Gerd; and Hasselbach, Petra, 4,578,207, Cl. 252-134.000.
Prescolite, Inc.: *See—*
Druffel, James B.; and Cohen, Joel S., 4,577,824, Cl. 248-544.000.
Preston, Jonathan M., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence of Her Majesty's Canadian Government. Chemical agent monitor and alarm device. 4,578,586, Cl. 250-382.000.
Price-Falcon, Juan F.; and Viramontes-Brown, Ricardo, to Hylsa, S.A. Method of reducing iron oxides. 4,578,110, Cl. 75-34.000.
Price, Lester F.: *See—*
Weaver, Gregory A.; Price, Lester F.; Britt, Crawford R.; and Shalaby, W. Shalaby, 4,578,451, Cl. 528-292.000.
Price, William F., to Ecometal Limited. Insulation panel assembly for use in the roofing and/or the cladding of walls of buildings. 4,577,445, Cl. 52-403.000.
Prince, Alfred M.: *See—*
Vnek, John; Prince, Alfred M.; and Ikram, Hafeez, 4,578,217, Cl. 260-112.50R.
Pringle, Ronald E., to Camco, Incorporated. Fluid actuated pipeline valve. 4,577,654, Cl. 137-219.000.
Pritulsky, James: *See—*
Coldren, Daniel R.; and Pritulsky, James, 4,577,920, Cl. 339-143.00R.
Procter & Gamble Company, The: *See—*
Buell, Kenneth B., 4,578,071, Cl. 604-379.000.
Burckett St. Laurent, James C. T. R.; and Eusch, Alfred, 4,578,200, Cl. 252-8.800.
Dirksing, William P.; Leman, Marvin G.; and Van Coney, Robert H., 4,578,028, Cl. 425-525.000.
Dysart, John K.; and Joffe, Frederick M., 4,578,073, Cl. 604-397.000.
Hofeler, Henry H., 4,577,453, Cl. 53-438.000.
Kramer, Timothy A.; Young, Gerald A.; and Kock, Ronald W., 4,578,068, Cl. 604-368.000.
Prohaska, Hans; and Sosthene, Daniele, to ITT Industries, Inc. Vehicle light with several incandescent lamps having improved contact means. 4,578,741, Cl. 362-249.000.
Prough, J. Robert; and Torregrossa, Louis O., to Kamyr, Inc. Medium consistency mixer rotor and stator construction. 4,577,974, Cl. 366-307.000.
Prueher, Andrew B.: *See—*
Hennessy, Michael P.; and Prueher, Andrew B., 4,577,756, Cl. 206-444.000.
Pruitt, Darrell K. Dental wedge. 4,578,035, Cl. 433-149.000.
Pryor, Michael J.: *See—*
Winter, Joseph; and Pryor, Michael J., 4,577,925, Cl. 350-96.230.
Puech, Alain, to Societe Nouvelle Construction Metalliques de Provence. Anchoring device. 4,577,581, Cl. 114-294.000.
Puester, Neil H.: *See—*
Koehler, Charles W.; vanOmmering, Gerrit; and Puester, Neil H., 4,578,324, Cl. 429-26.000.
Puletti, Paul P.: *See—*
Schmidt, Robert C., Jr.; and Puletti, Paul P., 4,578,302, Cl. 428-110.000.
Pullen, Gene A.: *See—*
Schneider, Julian R.; and Pullen, Gene A., 4,577,978, Cl. 374-45.000.
Pullman, George D.: *See—*
Elias, Michael G.; and Pullman, George D., 4,577,996, Cl. 405-17.000.
Pullukat, Thomas J.; and Hoff, Raymond E., to Norchem, Inc. Polymerization catalyst and method. 4,578,440, Cl. 526-128.000.
Puri, Avinash D.; Fairchild, James L.; and Rodosevich, James B., to Kerr-McGee Chemical Corporation. Method for controlling boric acid particle size distribution. 4,578,086, Cl. 23-300.000.
Quaker Oats Company: *See—*
Tomomatsu, Hideo, 4,578,272, Cl. 426-18.000.
Quinlan, James M., to American Cyanamid Company. Diethylcarbamazine resinate and styrylpyridinium resinate-diethylcarbamazine resinate edible anthelmintic tablets for companion animals. 4,578,268, Cl. 424-79.000.
Quinlan, Patrick M., to Petrolite Corporation. Inhibiting corrosion with quaternary ammonium derivatives of 1,4-thiazine sulfonic acids. 4,578,243, Cl. 422-7.000.
Quinn, Robert O.; Govekar, Craig F.; and Piehl, James R., to Snap-on Tools Corporation. Microprocessor controlled timing/tachometer apparatus. 4,578,755, Cl. 364-431.010.
R. R. Donnelley & Sons Company: *See—*
Banike, Ronald, 4,577,560, Cl. 101-415.100.
Raab, Harald; and Gobel, Hilmar, to Fichtel & Sachs AG. Clutch disc for a motor vehicle friction clutch. 4,577,743, Cl. 192-106.200.
Rabain, Jacques; and Swaenepoel, Joseph, to Thomson-CSF. Method of synchronization of transmitter-receiver stations of a frequency-jumping network and a station for the practical application of said method. 4,578,816, Cl. 455-27.000.
Rabain, Jacques; and Adrian, Serge, to Thomson-CSF. Method for establishing communications in a network of frequency-jumping transmitter-receiver stations and a station for the utilization of said method. 4,578,817, Cl. 455-27.000.
Rabatin, Jacob G., to General Electric Company. Process for the preparation of rare earth oxyhalide phosphor. 4,578,211, Cl. 252-301.40H.
Racca, Richard F.; Swier, Willem; and Di Maio, Anthony E., to Marson Corporation. Dispenser. 4,577,783, Cl. 222-386.500.
Rach, Heinz-Dieter: *See—*
Seitz, Hans; Pieper, Henner; Frerichs, Udo; and Rach, Heinz-Dieter, 4,577,668, Cl. 152-520.000.
Racine, Marsh V. Computer aided coordinate digitizing system. 4,578,768, Cl. 364-560.000.
Rado, Theodore A., to Kerr-McGee Chemical Corporation. Method for processing gaseous effluent streams recovered from the vapor phase oxidation of metal halides. 4,578,090, Cl. 55-48.000.
Rainin Instrument Company, Inc.: *See—*
Rainin, Kenneth; and Ruskewicz, Stephen, 4,577,760, Cl. 206-508.000.
Rainin, Kenneth; and Ruskewicz, Stephen, to Rainin Instrument Company, Inc. Apparatus for supporting pipette tips. 4,577,760, Cl. 206-508.000.
Rainville, Gilles, to Rockwell International Corporation. Method of fabricating expanded sandwich panels having an enclosed core. 4,577,798, Cl. 228-157.000.
Rajala, Gregory J.: *See—*
Oshefsky, Daniel J.; Gavronski, Paul A.; Vogt, Robert E.; and Rajala, Gregory J., 4,578,133, Cl. 156-164.000.
Ramsay, Mitchell. Surgical instrument tray. 4,577,755, Cl. 206-370.000.
Rana, Mahendrasinh D.; and Selines, Ronald J., to Union Carbide Corporation. High strength steel. 4,578,113, Cl. 75-124.000.

Rancourt, James D.; and Beauchamp, William T., to Optical Coating Laboratory, Inc. Articles having improved reflectance suppression. 4,578,527, Cl. 136-256.000.
Randolph, Edward F.: *See—*
Allen, J. Dewayne; and Randolph, Edward F., 4,577,993, Cl. 404-112.000.
Raney, Gerard E. Portable unitary battery powered hand-held magnifying apparatus. 4,577,927, Cl. 350-235.000.
Rangaswamy, Subramaniam; and Harrington, John H., to METCO Inc. Aluminum and yttrium oxide coated thermal spray powder. 4,578,114, Cl. 75-252.000.
Rangaswamy, Subramaniam: *See—*
Harrington, John H.; and Rangaswamy, Subramaniam, 4,578,115, Cl. 75-255.000.
Rao, Kameswara K.: *See—*
Fang, Sheng; and Rao, Kameswara K., 4,578,777, Cl. 365-184.000.
Rapp, Jeffrey C.: *See—*
Wilson, Joseph H.; Rapp, Jeffrey C.; Southern, Brian K.; and Elliott, Martin E., 4,578,185, Cl. 210-85.000.
Rasmussen, Erik, to Aktieselskabet Nordiske Kabel-OG Traadfabriker. Process for non-destructive separation of mixtures containing plastics scrap. 4,578,184, Cl. 209-3.000.
Rasshofer, Werner; and Balle , Gerhard, to Bayer Aktiengesellschaft. Polyamines and a process for their production. 4,578,500, Cl. 560-25.000.
Rattan, Dev R.: *See—*
Parker, Robert R.; and Rattan, Dev R., 4,578,718, Cl. 360-10.300.
Rawlinson, Stephen J.: *See—*
Amdahl, Gene M.; Lee, Hsiao-Peng S.; Rawlinson, Stephen J.; and Stuart, Stephen F., 4,578,750, Cl. 364-200.000.
Ray-Chaudhuri, Dilip K.: *See—*
Rossi, Robert D.; and Ray-Chaudhuri, Dilip K., 4,578,444, Cl. 526-288.000.
Ray, Colin J.; and Smith, Geoffrey, to Vickers Public Limited Company. Dynamometers. 4,577,497, Cl. 73-126.000.
Raydx Satellite Systems, Ltd.: *See—*
Hooper, Robert L.; and Yonge, Lawrence W., III, 4,578,682, Cl. 343-916.000.
Raymond Engineering Inc.: *See—*
Snyder, Robert F., 4,577,912, Cl. 308-2.00R.
Raymond, Roger S., to Rockwell International Corporation. Apparatus and method for making laminate structures. 4,577,797, Cl. 228-118.000.
Rayne, Joseph, to Chrysler Corporation. Front suspension alignment tool. 4,577,534, Cl. 81-484.000.
Rayner, Adrien P.; and Clark, Kenneth R., to Metal Box Plc. Containers and lever ring. 4,577,776, Cl. 220-307.000.
Raytheon Company: *See—*
Shapiro, Jonathan S., 4,578,767, Cl. 364-550.000.
RCA Corporation: *See—*
Corboy, John F., Jr.; Jastrzebski, Lubomir L.; Blackstone, Scott C.; and Pagliaro, Robert H., Jr., 4,578,142, Cl. 156-612.000.
Reach, Gerard: *See—*
Jaffrin, Michel; and Reach, Gerard, 4,578,191, Cl. 210-323.200.
Readings, Peter B.; Mihalik, Nandor; and Taylor, Robin, to Sensitisers (Research) Ltd. Acidic photosensitive relief image-forming materials with indicator pigment or dye. 4,578,341, Cl. 430-155.000.
Reardon, Daniel R., to Hughes Tool Company. Pressure operated test valve. 4,577,692, Cl. 166-321.000.
Reckert, Jurgen: *See—*
Hofmann, Horst; and Reckert, Jurgen, 4,577,789, Cl. 225-100.000.
Recycloplast AG: *See—*
Weichenrieder, Erich, 4,577,980, Cl. 384-488.000.
Regan, Michael T.; and Wright, Hal E., to Eastman Kodak Company. Hydroxyaluminumphthalocyanine having reduced green absorption. 4,578,330, Cl. 430-37.000.
Regan, Michael T.: *See—*
Borsenberger, Paul M.; Regan, Michael T.; and Staudenmayer, William J., 4,578,334, Cl. 430-59.000.
Regnier, Kent E.: *See—*
Stipanuk, John M.; Walse, Alan S.; and Regnier, Kent E., 4,577,922, Cl. 339-176.0MP.
Rehag, Klaus; and Gerretz, Josef, to Mannesmann Demag Wean. System for the continuous operation of a cold pilger rolling mill. 4,577,483, Cl. 72-214.000.
Reil, Wilhelm, to Tetra Pak Developpement S.A. Apparatus for punching a hole in a paper web. 4,578,004, Cl. 408-87.000.
Reinartz, Dieter; Bender, Heinrich; and Laurent, Gunter, to Didier-Werke AG. Process for removing polychlorinated biphenyls from transformer-insulating liquids. 4,578,194, Cl. 210-673.000.
Reinhardt, Wilhelm; and Rudele, Ulrich, to ebm Elektrobau Mulfingen GmbH & Co. Electric motor with a system for monitoring speed. 4,578,605, Cl. 310-67.00R.
Reist, Walter, to Feramatic AG. Apparatus and method for removing and conveying away a sample copy from an orderly flow of printed products. 4,577,855, Cl. 271-281.000.
Remote Interrogations Pty. Ltd.: *See—*
Townsing, Leslie C., 4,578,539, Cl. 179-2.00A.
Renaux, Charley: *See—*
Artaud, Robert; Aubert, Michel; and Renaux, Charley, 4,578,238, Cl. 376-404.000.
Rengo Co., Ltd.: *See—*
Tokuno, Masateru; Sawada, Tetsuya; and Mori, Yasuharu, 4,577,746, Cl. 198-462.000.
Rentsch, Stefan: *See—*
Marko, Ollie W.; Steinmeyer, Robert D.; and Rentsch, Stefan, 4,578,494, Cl. 556-452.000.
Reptech, Inc.: *See—*
Carlson, Robert A.; and Smith, Nicholas H., 4,577,839, Cl. 266-272.000.
Research Association for Petroleum Alternatives Development: *See—*
Morimoto, Nobuyuki; Takatsu, Kozo; and Sugimoto, Michio, 4,578,259, Cl. 423-329.000.
Rethy, Lajos: *See—*
Csizer, Zoltan; Sikos, Karoly; Bacskai, Laszlo; Joo, Istvan; Niedermayer, Eleonora; Rethy, Lajos; and Zsidai, Jozsef, 4,578,270, Cl. 424-92.000.
Revlon, Inc.: *See—*
Tietjen, Marlene; Brown, Ivonne; and Macchio, Ralph A., 4,578,266, Cl. 424-63.000.
Rexnord Inc.: *See—*
Martin, Donald E., 4,577,747, Cl. 198-500.000.
Rezek, Edward A.; and Zinkiewicz, Lawrence M., to TRW Inc. Liquid phase epitaxial growth process. 4,578,126, Cl. 148-171.000.
Rheinische Braunkohlenwerke AG: *See—*
Adlhoch, Wolfgang H.; and Lambertz, Johannes, 4,578,226, Cl. 261-71.000.
Rheinmetall GmbH: *See—*
Romer, Rudolf; and Moll, Manfred, 4,577,813, Cl. 244-3.230.
Rhone-Poulenc Specialties Chimiques: *See—*
Soula, Gerard; and Simonnet, Christian, 4,578,495, Cl. 556-468.000.
Richards, David L.; and Windish, Willis E., to Caterpillar Tractor Co. Vehicle transfer gear and drive line brake mechanism. 4,577,524, Cl. 74-411.500.
Richardson, Jennings R. Portable multipurpose desk container. 4,577,788, Cl. 224-273.000.
Richardson, John H. Shingle loading ladder. 4,578,016, Cl. 414-680.000.
Richter, Ekkehard; Korbacher, Werner; Knoblauch, Karl; Giessler, Klaus; and Harder, Klaus-Burkhard, to Bergwerksverband GmbH. Method of separating highly adsorbable components in a gas stream in a pressure-sensing adsorber system. 4,578,089, Cl. 55-26.000.
Richter, Ole J.: *See—*
Andersen, Per B.; and Richter, Ole J., 4,577,663, Cl. 138-31.000.
Richter, Walter, to Siemens Aktiengesellschaft. Electrical control arrangement for a rolling mill drive motor of a rolling mill. 4,578,626, Cl. 318-338.000.
Richtmeyer, Robert D.: *See—*
Fredericksen, Arnold E.; and Richtmeyer, Robert D., 4,577,911, Cl. 308-2.00R.
Rickert, David W.: *See—*
McIntosh, Robert; Mathews, Harlan P.; Rickert, David W.; Romano, Paul; and Walker, Jerry, 4,578,786, Cl. 369-44.000.
Ricoh Company, Ltd.: *See—*
Ikeda, Itsuo; Kurokawa, Junji; Hasebe, Mitsuo; Miyagawa, Seiichi; and Hariu, Hajime, 4,578,331, Cl. 430-42.000.
Kajiwara, Norio, 4,577,954, Cl. 355-4.000.
Mayer, Edward F.; and Pfeuffer, Donald F., 4,577,955, Cl. 355-15.000.
Yamaguchi, Shingo, 4,578,715, Cl. 358-283.000.
Rieck, Hans-Peter, to Hoechst Aktiengesellschaft. Process for the preparation of crystalline sheet-type alkali metal silicates. 4,578,258, Cl. 423-325.000.
Rieck, Hans-Peter; and Kalz, Hans-Jurgen, to Hoechst Aktiengesellschaft. Aluminosilicates having a zeolite structure, and process for the manufacture thereof. 4,578,371, Cl. 502-71.000.
Rieger, Martin M., to Warner-Lambert Company. Methods for treating inflammation. 4,578,405, Cl. 514-679.000.
Riegger, Siegfried: *See—*
Pipper, Gunter; Riegger, Siegfried; and Floss, Josef G., 4,578,455, Cl. 528-501.000.
Rieter Machine Works, Ltd.: *See—*
Roder, Kurt, 4,577,372, Cl. 19-159.00A.
Riker, Rudolf, to Stetter GmbH. Sludge settling plant. 4,578,189, Cl. 210-253.000.
Ripley, Robert W.: *See—*
Borsh, Richard J.; Ripley, Robert W.; and Pate, Harold T., 4,578,528, Cl. 174-65.00G.
Ritsko, Joseph E.; and Acla, Howard L., to GTE Products Corporation. Removal of chromium from cobalt. 4,578,251, Cl. 423-55.000.
Ritter, Thomas E., to Halliburton Company. Method and apparatus for providing accurate wireline depth measurements. 4,577,410, Cl. 33-129.000.
RM Metal Consulting Ky: *See—*
Malmstrom, Rolf, 4,578,254, Cl. 423-88.000.
Robbins, Jeffrey D.: *See—*
Bayer, Arthur C.; Robbins, Jeffrey D.; and Bowler, Donald J., 4,578,224, Cl. 260-502.50F.
Robert Bosch GmbH: *See—*
Arnold, Herbert; Horbelt, Michael; Seibel, Berthold; Strobele, Hans-Peter; and Werner, Peter, 4,577,605, Cl. 123-479.000.
Bamer, Franz, 4,577,495, Cl. 73-118.000.
Bohringer, Wilfried; Eheim, Franz, deceased; Fehlmann, Wolfgang; Laufer, Helmut; and Zibold, Karl, 4,577,606, Cl. 123-506.000.
Heitmann, Jurgen; Loos, Rolf; and Wagner, Peter, 4,578,719, Cl. 360-31.000.
Schmatz, Jurgen, 4,577,610, Cl. 123-633.000.
Stabler, Manfred, 4,577,526, Cl. 74-609.000.

Roberts, Lyn M.; Shrier, Robert L.; and Laxton, Raymond, to AGB Research PLC. Apparatus for storing data relating to television viewing. 4,578,700, Cl. 358-84.000.

Robertson, John M., to Rolls-Royce Limited. Exhaust mixing in turbofan aeroengines. 4,577,462, Cl. 60-262.000.

Robinson, Morton: *See—*
Pastor, Ricardo C.; and Robinson, Morton, 4,578,252, Cl. 423-76.000.

Rocket of London Limited: *See—*
Meredith, Hadyn G., 4,577,635, Cl. 128-642.000.

Rockinger Spezialfabrik fur Anhangerkupplungen GmbH & Co.: *See—*
Breu, Johann, 4,577,885, Cl. 280-508.000.

Rockwell International Corporation: *See—*
Bake, Earl A.; and Hartle, Clair W., Jr., 4,577,872, Cl. 277-12.000.
Rainville, Gilles, 4,577,798, Cl. 228-157.000.
Raymond, Roger S., 4,577,797, Cl. 228-118.000.
Williams, Richard J., 4,577,734, Cl. 188-218.00R.

Roder, Kurt, to Rieter Machine Works, Ltd. Drawing frame. 4,577,372, Cl. 19-159.00A.

Rodosevich, James B.: *See—*
Puri, Avinash D.; Fairchild, James L.; and Rodosevich, James B., 4,578,086, Cl. 23-300.000.

Roe, William J.; and Malito, John T., to Kaiser Aluminum Chemical Corporation; and Nalco Chemical Company. Purification of Bayer process liquors. 4,578,255, Cl. 423-130.000.

Rogers Manufacturing Co., The: *See—*
Bitel, Vincent J., 4,577,773, Cl. 220-22.300.

Rolls-Royce Limited: *See—*
Robertson, John M., 4,577,462, Cl. 60-262.000.
Sadler, Michael, 4,578,611, Cl. 310-338.000.

Rolow, Willard J. Deployable vehicular barricade. 4,577,991, Cl. 404-6.000.

Romano, Paul: *See—*
McIntosh, Robert; Mathews, Harlan P.; Rickert, David W.; Romano, Paul; and Walker, Jerry, 4,578,786, Cl. 369-44.000.

Romer, Rudolf; and Moll, Manfred, to Rheinmetall GmbH. Discus-shaped projectile. 4,577,813, Cl. 244-3.230.

Romi, Romeu. Gear transmission assembly. 4,577,529, Cl. 74-665.0GA.

Rominger, Karl L.: *See—*
Stricker, Herbert; Freund, Bernhard; Harwalik, Heribert; Rominger, Karl L.; Darda, Siegfried; Haselbarth, Volkmar; Arndts, Dietrich; Bechtel, Wolf D.; Bozler, Gerhard; Brickl, Rolf; and Gruber, Peter, 4,578,264, Cl. 424-37.000.

Roos, Eberhard, to Delma, electro- und medizinische Appatebau Gesellschaft mbH. Operating theatre lamp. 4,578,575, Cl. 250-203.00R.

Rosenberg, Martin, to United States of America, Health and Human Services. Plasmid cloning vector pAS1. 4,578,355, Cl. 435-317.000.

Rosenbush, David M.; Zwicke, Philip E.; and Couch, Robert P., to United Technologies Corporation. Adaptive electrostatic engine diagnostics. 4,578,756, Cl. 364-431.020.

Rosevear, Alan; and Lambe, Christopher A., to United Kingdom Atomic Energy Authority. Production of chemical compounds with immoblized plant cells. 4,578,351, Cl. 435-41.000.

Rosini, Sergio, to Istituto Gentili S.p.A. Pharmaceutical compositions for the treatment of osteopathias. 4,578,376, Cl. 514-108.000.

Ross, William E.; and MacNeal, Bruce E., to Litton Systems, Inc. Altering the switching threshold of a magnetic material. 4,578,321, Cl. 428-693.000.

Rossi, Pietro P.; Senni, Paolo; and Ferruzzi, Sergio, to Chimica del Friuli S.p.A.; and Snia BPD S.p.A. Method of preparing pure benzoic acid. 4,578,511, Cl. 562-494.000.

Rossi, Robert D.; and Ray-Chaudhuri, Dilip K., to National Starch and Chemical Corporation. Anaerobic adhesives containing polymerizable activators. 4,578,444, Cl. 526-288.000.

Roth, Steven C.: *See—*
Bur, Anthony J.; and Roth, Steven C., 4,577,510, Cl. 73-708.000.

Rott, Hans; Koerner, Gotz; and Schmidt, Gunter, to Th. Goldschmidt AG. Organosilicon compounds and textile fiber finishes containing these. 4,578,116, Cl. 106-18.120.

Rottinghaus, Robert B. Cushion mounted disc with interconnecting spool assembly. 4,577,699, Cl. 172-570.000.

Rowe, Raymond G., to General Electric Company. Oxysulfide dispersion strengthened titanium alloys. 4,578,129, Cl. 148-407.000.

Roy, Jehan; and Dubois, Jean, to Lacoste, SA. Folding wheelchair. 4,577,878, Cl. 280-242.0WC.

Rudele, Ulrich: *See—*
Reinhardt, Wilhelm; and Rudele, Ulrich, 4,578,605, Cl. 310-67.00R.

Ruger, William B.; and Larson, Lawrence L., to Sturm, Ruger & Company, Inc. Trigger and spring mount mechanism. 4,577,430, Cl. 42-69.00R.

Ruhrchemie Aktiengesellschaft: *See—*
Bahrmann, Helmut; Cornils, Boy; Konkol, Werner; and Lipps, Wolfgang, 4,578,523, Cl. 568-454.000.

Ruhrgas LNG Flussigerdgas Service GmbH: *See—*
Meyer, Hans, 4,577,578, Cl. 114-248.000.

Rummo, Gregory J.; and Startup, Robert, to Kay-Fries, Inc. Bisalkyl bis(trialkanol amine)zirconates and use of same as thickening agents for aqueous polysaccharide solutions. 4,578,488, Cl. 556-56.000.

Ruoslahti, Erkki; and Pierschbacher, Michael, to La Jolla Cancer Research Foundation. Tetrapeptide. 4,578,079, Cl. 623-11.000.

Ruskewicz, Stephen: *See—*
Rainin, Kenneth; and Ruskewicz, Stephen, 4,577,760, Cl. 206-508.000.

Russnak, Clarence J., to Boeing Company, The. Weapon system transporter. 4,577,965, Cl. 356-138.000.

Russo, Mario A.: *See—*
Melrose, David R.; and Russo, Mario A., 4,577,661, Cl. 137-625.330.

Ruzumna, Edward. Apparatus for promoting good health. 4,577,710, Cl. 177-245.000.

Ryobi Ltd.: *See—*
Ishii, Koji; and Maehara, Kenso, 4,577,555, Cl. 101-76.000.

S.A.M. Microtechnic: *See—*
Bennardo, Gilbert, 4,577,750, Cl. 206-1.500.

S&C Electric Company: *See—*
Lin, Chester H., 4,578,551, Cl. 200-153.0SC.

S.I.A.T.A. Societa Italiana Apparecchiature Trattamento Acqua S.p.A.: *See—*
Ferrali, Luigi, 4,577,498, Cl. 73-198.000.

Sabourin, Edward T.: *See—*
Onopchenko, Anatoli; and Sabourin, Edward T., 4,578,497, Cl. 556-479.000.

Saccocio, Edward J.; Kiser, T. Kay; Wright, Richard F.; and Head, Donald L., to Mead Corporation, The. Free particle abrasion development of imaging sheets employing photosensitive microcapsules. 4,578,340, Cl. 430-138.000.

Sadahiro, Hisanori, to Sakai Heavy Industries Ltd. Mechanism for generating vibrations for a ground compacting machine. 4,577,995, Cl. 404-117.000.

Sadler, Michael, to Rolls-Royce Limited. Piezoelectric stress wave transducer with boron nitride piezo support. 4,578,611, Cl. 310-338.000.

Sadre-Marandi, Ehsan: *See—*
Fox, Anthony G.; Smith, Harry L. O.; and Sadre-Marandi, Ehsan, 4,577,947, Cl. 354-275.000.

Safarik, William F., to Garrett Corporation, The. Ram air turbine. 4,578,019, Cl. 416-1.000.

Sagawa, Norihiko: *See—*
Gotou, Tadashi; Kawamura, Fumio; Sagawa, Norihiko; and Yusa, Hideo, 4,578,325, Cl. 429-91.000.

Sagedahl, Steven M. Isokinetic exercise apparatus and method. 4,577,862, Cl. 272-125.000.

Sahashi, Masashi; Inomata, Koichiro; Sori, Naoyuki; and Yamamiya, Hideki, to Tokyo Shibaura Denki Kabushiki Kaisha. Permanent magnet. 4,578,125, Cl. 148-31.570.

Sahasrabudhe, Arum P.; Dadpey, Habib; Cirillo, Fernando A.; Merlo, Antonia C.; and Zuber, Pierre A. M., to Westinghouse Electric Corp. Vehicle brake control apparatus and method. 4,578,754, Cl. 364-426.000.

Saida, Chiaki, to Aisin Seiki Kabushiki Kaisha. Clutch disc. 4,577,742, Cl. 192-106.200.

Saint-Gobain Recherche: *See—*
Colmon, Daniel; and Letemps, Bernard, 4,578,102, Cl. 65-114.000.

St-Jacques, Jean. Retainer for soap dish. 4,577,751, Cl. 206-77.100.

St. Lawrence Reactors Limited: *See—*
Assarsson, Per G.; and Nagasuye, Joseph H., 4,578,353, Cl. 435-161.000.

Saito, Naoki, to Nippon Seiko Kabushiki Kaisha. Power assist steering gear assembly. 4,577,715, Cl. 180-79.100.

Saito, Shigeakira; and Fukuoka, Masayuki, to Asahikasei Kabushiki Kaisha. Electric cells using fluorinated graphite as active material of positive electrode. 4,578,327, Cl. 429-194.000.

Saito, Teruo; Asai, Kuniaki; and Hieda, Kazuo, to Sumitomo Chemical Company, Limited. Coating resin composition. 4,578,427, Cl. 525-150.000.

Saitoh, Shigeru, to Masudaya Corporation Limited. Magnetically movable model toy. 4,578,044, Cl. 446-134.000.

Sakagami, Teruo; Fujii, Yasufumi; and Murayama, Naohiro, to Kureha Kagaku Kogyo Kabushiki Kaisha. Halogen-containing lens material. 4,578,445, Cl. 526-292.300.

Sakai Heavy Industries Ltd.: *See—*
Sadahiro, Hisanori, 4,577,995, Cl. 404-117.000.

Sakai, Kazushige: *See—*
Nagano, Hiroyuki; Takagi, Mitiro; Kubodera, Noboru; Matsunaga, Isao; Nabata, Hiroyuki; Ohba, Yasuhiro; Sakai, Kazushige; Hata, Shun-ichi; and Uchida, Yasumi, 4,578,465, Cl. 544-285.000.

Sakai Manufacturing Co., Ltd.: *See—*
Sakai, Yoshitaka, 4,578,049, Cl. 474-8.000.

Sakai, Takami: *See—*
Inokuchi, Haruhisa; and Sakai, Takami, 4,578,743, Cl. 363-35.000.

Sakai, Yoshitaka, to Sakai Manufacturing Co., Ltd. Pulley device. 4,578,049, Cl. 474-8.000.

Sakakima, Hiroshi; Satomi, Mitsuo; Yanagiuchi, Yukihiro; and Senno, Harufumi, to Matsushita Electric Industrial Co., Ltd. Magnetic head. 4,578,728, Cl. 360-125.000.

Sakamoto, Masami; Nagumo, Ryoichi; and Ishihara, Tamio, to Hitachi, Ltd. Pen changing apparatus for plotter. 4,577,409, Cl. 33-18.100.

Sakudo, Noriyuki: *See—*
Yamamoto, Naoki; and Sakudo, Noriyuki, 4,577,396, Cl. 29-576.00B.

Sakura Color Products Corp.: *See—*
Nakanishi, Mikihiko, 4,578,117, Cl. 106-20.000.

Sakurai, Akira: *See—*
Hayashi, Masanori; Sakurai, Akira; and Aso, Shigeru, 4,577,976, Cl. 374-29.000.

Sakurai, Masanori; Miyawaki, Junichi; Umemura, Toshikaju; Kawata, Toshikatsu; and Kiboshi, Shinji, to Mitsubishi Gas Chemical Company, Inc. Acetal resin composition. 4,578,422, Cl. 524-593.000.

Salamone, Ann B., to Morton Thiokol, Inc. Skin conditioning polymer containing alkoxylated nitrogen salts of sulfonic acid. 4,578,267, Cl. 424-78.000.

Salhi, Ali: *See*—
Labeeuw, Bernard; and Salhi, Ali, 4,578,377, Cl. 514-206.000.

Salia-Munoz, Miguel. Method and apparatus for self-examination of the ocular globe. 4,577,943, Cl. 351-205.000.

Salicini, Sandro, to Carle & Montanari S.p.A. Device for detecting the presence of an article in the recesses of the feeding disc of a wrapping machine. 4,577,451, Cl. 53-58.000.

Salomon S.A.: *See*—
Petrini, Roland; Pradier, Serge; and Mabboux, Michel, 4,577,420, Cl. 36-117.000.

Sander, Hans: *See*—
Lenz, Werner; Sander, Hans; and Moeller, Dieter, 4,578,426, Cl. 525-131.000.

Sanders, Thomas C.; and Calvert, Wynne, to Lockheed Missiles & Space Company, Inc. Magnetic assembly. 4,578,663, Cl. 335-306.000.

Sanderson, Dewey S. C. Changeable wall panel structure. 4,577,444, Cl. 52-311.000.

Sandstrom, Paul H.: *See*—
Budd, William; and Sandstrom, Paul H., 4,578,411, Cl. 524-156.000.

Sandvik, Johannes, to Elkem A/S. Feed device for guiding a rope onto a winding drum. 4,577,810, Cl. 242-157.100.

Sangamo Weston, Inc.: *See*—
Simonetti, John J., 4,578,213, Cl. 252-301.170.

Sanofi: *See*—
Labeeuw, Bernard; and Salhi, Ali, 4,578,377, Cl. 514-206.000.

Sanshin Kogyo Kabushiki Kaisha: *See*—
Sumino, Yoshitsugu; and Harada, Hiroshi, 4,578,040, Cl. 440-73.000.

Santiago, Antonio O. Security window. 4,577,438, Cl. 49-57.000.

Santorelli, Michael, to Schenectady Chemicals Inc. Phenolic resins, carboxylic resins and the elastomers containing adhesive. 4,578,315, Cl. 428-414.000.

Santorelli, Michael, to Schenectady Chemicals, Inc. Phenolic resins, carboxylic resins and the elastomers containing adhesive. 4,578,425, Cl. 525-109.000.

Santos, Joe, to Fairchild Camera & Instrument Corporation. Circuit and method for split bias enable/inhibit memory operation. 4,578,594, Cl. 307-241.000.

Santrade Ltd.: *See*—
Schermutzki, Konrad, 4,578,021, Cl. 425-6.000.

Sanyo Electric Co., Ltd.: *See*—
Nishida, Susumu; Kimura, Seiji; Kobayashi, Akio; and Fuchigami, Tadashi, 4,577,915, Cl. 312-214.000.

Sarnoff, Stanley J.; Calkins, George B.; and Tarello, William R., to Survival Technology Inc. Plural dosage automatic injector with improved safety. 4,578,064, Cl. 604-191.000.

Sartor, Mariano, to Nordica S.p.A. Foot locking device particularly for front entrance ski boots. 4,577,421, Cl. 36-119.000.

Sasaki, Kazuhiko: *See*—
Amano, Akira; and Sasaki, Kazuhiko, 4,577,455, Cl. 56-17.100.

Sasaki, Ryoichi, to Brother Industries, Ltd. Recording apparatus. 4,577,982, Cl. 400-17.000.

Sasamori, Eizo: *See*—
Sawamura, Mitsuharu; Ito, Susumu; Matsushima, Masaaki; Kishi, Hiroyoshi; Sasamori, Eizo; Yoshihara, Satoshi; Iijima, Shigeharu; and Takano, Katsuhiko, 4,578,322, Cl. 428-694.000.

Sasamura, Kouhei, to Victor Company of Japan, Limited. Amplifier circuit. 4,578,647, Cl. 330-253.000.

Sato, Kimiaki: *See*—
Takemae, Yoshihiro; Nakano, Tomio; and Sato, Kimiaki, 4,578,776, Cl. 365-149.000.

Sato, Yoshiyuki; Isozaki, Akio; Higo, Tomio; and Uchida, Tetsuo, to Kabushiki Kaisha Kobe Seiko Sho. Boiling heat transfer pipes. 4,577,381, Cl. 29-157.400.

Satoh, Takane; and Tan, Yoichi, to Fuji Xerox Co., Ltd. Asynchronous connecting device. 4,578,797, Cl. 375-25.000.

Satomi, Mitsuo: *See*—
Sakakima, Hiroshi; Satomi, Mitsuo; Yanagiuchi, Yukihiro; and Senno, Harufumi, 4,578,728, Cl. 360-125.000.

Satzinger, Gerhard; Barth, Hubert; Hartenstein, Johannes; Herrmann, Manfred; Fritschi, Edgar; and Schutt, Ilse-Dore, to Warner-Lambert Company. 5H-[1]benzopyrano[2,3-d]pyrimidine derivatives useful for controlling lesions of the gastric and duodenal mucous membranes. 4,578,380, Cl. 514-232.000.

Sauers, Richard F.: *See*—
Hay, James V.; and Sauers, Richard F., 4,578,108, Cl. 71-93.000.

Saundry, Richard H.; and Savidge, Geoffrey F., to Special Trustees for St. Thomas' Hospital, The. Purification of factor VIII with insoluble matrix having free sulfate groups covalently bound thereto. 4,578,218, Cl. 260-112.00B.

Saunier, Christian: *See*—
de Guillenschmidt, Pierre; Hubert, Jacques; Goujon, Michel; and Saunier, Christian, 4,577,962, Cl. 356-5.000.

Savidge, Geoffrey F.: *See*—
Saundry, Richard H.; and Savidge, Geoffrey F., 4,578,218, Cl. 260-112.00B.

Savit, Carl H., to Western Geophysical Company of America. Method for improving the efficiency of air guns. 4,577,723, Cl. 181-120.000.

Sawada, Tetsuya: *See*—
Tokuno, Masateru; Sawada, Tetsuya; and Mori, Yasuharu, 4,577,746, Cl. 198-462.000.

Sawamura, Mitsuharu; Ito, Susumu; Matsushima, Masaaki; Kishi, Hiroyoshi; Sasamori, Eizo; Yoshihara, Satoshi; Iijima, Shigeharu; and Takano, Katsuhiko, to Canon Kabushiki Kaisha. Recording medium. 4,578,322, Cl. 428-694.000.

Sawyer, Lawrence H.; and Knight, George W., to Dow Chemical Company, The. Wettable olefin polymer fibers. 4,578,414, Cl. 524-310.000.

Schack, Carl J.; and Christe, Karl O., to United States of America, Air Force. Multi-($OTeF_5$)-substituted fluorocarbons. 4,578,225, Cl. 260-550.000.

Schaeder, Walter: *See*—
Koppa, Daniel A.; and Schaeder, Walter, 4,578,027, Cl. 425-298.000.

Schaeffler, Robert G.: *See*—
Hertl, William; and Schaeffler, Robert G., 4,578,323, Cl. 429-15.000.

Schafer, Peter: *See*—
van Rijckevorsel, Rainer; Kasielke, Joachim; Macho, Heinz; Schafer, Peter; and Nenninger, Klaus, 4,578,716, Cl. 360-1.000.

Schaffel, Steven D., to Abbott Laboratories. Immunoassay for carcinoembryonic antigen (CEA). 4,578,349, Cl. 435-7.000.

Schedwin, Sven-Erik. Clamping device. 4,577,847, Cl. 269-309.000.

Scheinpflug, Hans: *See*—
Jager, Gerhard; Bockmann, Klaus; Buchel, Karl H.; Brandes, Wilhelm; Frohberger, Paul-Ernst; and Scheinpflug, Hans, 4,578,396, Cl. 514-383.000.

Schenectady Chemicals Inc.: *See*—
Santorelli, Michael, 4,578,315, Cl. 428-414.000.
Santorelli, Michael, 4,578,425, Cl. 525-109.000.

Schermutzki, Konrad, to Santrade Ltd. Apparatus for the production of granules from two-phase mixtures. 4,578,021, Cl. 425-6.000.

Scheuble, Bernhard: *See*—
Praefcke, Klaus; Kohne, Bernd; Poules, Wadi; Eidenschink, Rudolf; and Scheuble, Bernhard, 4,578,210, Cl. 252-299.600.

Schibisch, Horst, to Dr. Ing. h.c.F. Porsche AG. Commercial vehicle, especially forklifter. 4,577,722, Cl. 180-315.000.

Schickaneder, Helmut; Szeleny, Istvan; Morsdorf, Peter; and Ahrens, Kurt H., to Ludwig Neumann & Co. GmbH. Quinazoline and medicaments containing these compounds. 4,578,389, Cl. 514-254.000.

Schier, Karl: *See*—
Deutschmann, Herbert; and Schier, Karl, 4,577,595, Cl. 123-41.350.

Schiller, Saul. Windowed indexed calibrated T-square and precision-lined drafting board having linear edges. 4,577,415, Cl. 33-430.000.

Schindlbeck, Gunther: *See*—
Hosel, Peter; and Schindlbeck, Gunther, 4,577,452, Cl. 53-266.00R.

Schlegel GmbH: *See*—
Schlegel, Wolfgang; Wilke, Arthur; and Stein, Roland, 4,577,844, Cl. 269-71.000.

Schlegel, Wolfgang; Wilke, Arthur; and Stein, Roland, to Schlegel GmbH. Vertically adjustable device. 4,577,844, Cl. 269-71.000.

Schloman, William W., Jr., to Goodyear Tire & Rubber Company, The. Accelerator-modified adhesion promoters for rubber to wire adhesion. 4,578,450, Cl. 528-254.000.

Schlumberger Technology Corporation: *See*—
Doremus, Bernard, 4,577,662, Cl. 137-630.140.

Schmatz, Jurgen, to Robert Bosch GmbH. Ignition distributor system for an internal combustion engine. 4,577,610, Cl. 123-633.000.

Schmid, Christoph, to Luk Lamellen und Kupplungsbau GmbH. Fluid-operated servomotor for actuation of clutches or the like. 4,577,741, Cl. 192-85.00V.

Schmid, Max: *See*—
Hansen, Hans-Jurgen; Schmid, Rudolf; and Schmid, Max, 4,578,462, Cl. 544-177.000.

Schmid, Rudolf: *See*—
Hansen, Hans-Jurgen; Schmid, Rudolf; and Schmid, Max, 4,578,462, Cl. 544-177.000.

Schmidgall, Hartzell H.: *See*—
Schmidgall, Jon A.; and Schmidgall, Hartzell H., 4,578,235, Cl. 264-71.000.

Schmidgall, Jon A.; and Schmidgall, Hartzell H., to Hawkeye Concrete Products Co. Method for lining pipe. 4,578,235, Cl. 264-71.000.

Schmidt, Glenn H.; and Schmidt, Howard F., to Schmidt, Glenn H. Fabrication of golf club heads. 4,577,669, Cl. 164-45.000.

Schmidt, Gunter: *See*—
Rott, Hans; Koerner, Gotz; and Schmidt, Gunter, 4,578,116, Cl. 106-18.120.

Schmidt, Howard F.: *See*—
Schmidt, Glenn H.; and Schmidt, Howard F., 4,577,669, Cl. 164-45.000.

Schmidt, Manfred; and Meyer, Karl-Heinrich, to Bayer Aktiengesellschaft. Process for the production of 2-aryl-4-acyl-1.3.4-oxdiazolones-(5). 4,578,476, Cl. 548-144.000.

Schmidt, Robert C., Jr.; and Puletti, Paul P., to National Starch and Chemical Corporation. Reinforced tape laminates. 4,578,302, Cl. 428-110.000.

Schmidt, Ronald L.; and Shaddock, Roland E., to Peabody Myers Corporation. Sewer and catch basin cleaning system. 4,578,198, Cl. 210-780.000.

Schmidt, Wilfried, to Telefunken electronic GmbH. Process for the production of a solar cell. 4,577,393, Cl. 29-572.000.

Schmitt, Dieter: *See*—
Urban, Manfred; and Schmitt, Dieter, 4,578,202, Cl. 252-33.400.

Schnapper, Christoph: *See*—
Weghaupt, Erich; Intichar, Lutz; and Schnapper, Christoph, 4,577,871, Cl. 277-8.000.

Schneider, Julian R.; and Pullen, Gene A., to Shell Oil Company. Field test for determining water in oil. 4,577,978, Cl. 374-45.000.

Schneider, Paul E. Intravenous catheter holder. 4,578,062, Cl. 604-174.000.

Schoch, Donald C.; and Engelmann, Albert C., to Tamerlane Corporation. Sheet metal ornaments having a lacy appearance and process for making them. 4,578,318, Cl. 428-615.000.

Schoeffler, William N. Advanced quick ball release sub. 4,577,614, Cl. 125-25.000.

Schoengen, Anton; Schreiber, Georg; and Schroeder, Heinz, to Dynamit Nobel Aktiengesellschaft. Preparation of terephthalic acid from a crude dimethyl terephthalate. 4,578,501, Cl. 560-77.000.

Schoenig, Frederick C., Jr.; and Grossman, Leonard N., to General Electric Company. Detection of radioactive accumulations within an incinerator. 4,577,565, Cl. 110-237.000.

Schoffmann, Franz: *See—*
Wrulich, Herwig; Schoffmann, Franz; and Maier, Wilfried, 4,577,892, Cl. 285-136.000.

Scholl, Frederick W.; and Coden, Michael H., to Codenoll Technology Corporation. Method and apparatus for recovering data and clock information from a self-clocking data stream. 4,578,799, Cl. 375-87.000.

Scholl, Hans-Peter: *See—*
Adams, Jurgen; and Scholl, Hans-Peter, 4,578,760, Cl. 364-467.000.

Schoner, Wolfgang, to Biofusion, Inc. Cell fusion. 4,578,167, Cl. 204-183.100.

Schorlemmer, Hans-Ulrich; Dickneite, Gerhard; Sedlacek, Hans-Harald; de Souza, Noel J.; and Dohadwalla, Alihussein N., to Hoechst Aktiengesellschaft. Use of the diterpene derivative forskolin for immunostimulation. 4,578,399, Cl. 514-455.000.

Schreiber, Georg: *See—*
Schoengen, Anton; Schreiber, Georg; and Schroeder, Heinz, 4,578,501, Cl. 560-77.000.

Schroeder, Charles M.: *See—*
Paek, Un C.; and Schroeder, Charles M., 4,578,098, Cl. 65-13.000.

Schroeder, Heinz: *See—*
Schoengen, Anton; Schreiber, Georg; and Schroeder, Heinz, 4,578,501, Cl. 560-77.000.

Schroeder, Mel C.: *See—*
Domagala, John M.; and Schroeder, Mel C., 4,578,473, Cl. 546-156.000.

Schubert, Jean-Denis: *See—*
Cruchon, Jean-Claude; and Schubert, Jean-Denis, 4,578,657, Cl. 333-211.000.

Schuhmann, Frank: *See—*
Bachmann, Bernd; Kuss, Peter; Schuhmann, Frank; and Wollner, Jurgen, 4,577,854, Cl. 271-227.000.

Schulte, John P.: *See—*
Knecht, Thomas A.; Frick, Roger L.; and Schulte, John P., 4,578,735, Cl. 361 283.000.

Schultz, Ludwig; and Gaube, Franz, to Siemens Aktiengesellschaft. Method for manufacturing a metallic body using an amorphous alloy. 4,578,123, Cl. 148-11.50Q.

Schulz, Judith D. Bag book. 4,577,889, Cl. 281-15.00R.

Schulze-Berge, Klaus: *See—*
Boehm, Udo; Grittmann, Ernst-Juergen; and Schulze-Berge, Klaus, 4,578,726, Cl. 360-99.000.

Schumann, Frank: *See—*
Engel, Andreas; Schumann, Frank; Stiefel, Werner; and Freistedt, Reinhold, 4,578,052, Cl. 493-11.000.

Schuster, Gary B. A., to Owens-Corning Fiberglas Corporation. Precious metal vaporization reduction. 4,578,362, Cl. 501-17.000.

Schutt, Ilse-Dore: *See—*
Satzinger, Gerhard; Barth, Hubert; Hartenstein, Johannes; Herrmann, Manfred; Fritschi, Edgar; and Schutt, Ilse-Dore, 4,578,380, Cl. 514-232.000.

Scotfoam Corporation: *See—*
Volz, Robert A., 4,578,406, Cl. 521-52.000.

Scott, Daniel G.; and Hill, Theodore B., to American Standard Inc. O-ring seal in channel with fluid pressure equalization means. 4,577,870, Cl. 277-1.000.

Scott, Oscar T., IV: *See—*
Clem, Jack L.; and Scott, Oscar T., IV, 4,577,680, Cl. 165-95.000.

Scott, Ray V., Jr.: *See—*
House, David W.; and Scott, Ray V., Jr., 4,578,446, Cl. 528-64.000.

Seagate Technology: *See—*
Brannan, William L., Jr., 4,578,721, Cl. 360-51.000.

Sedlacek, Hans-Harald: *See—*
Schorlemmer, Hans-Ulrich; Dickneite, Gerhard; Sedlacek, Hans-Harald; de Souza, Noel J.; and Dohadwalla, Alihussein N., 4,578,399, Cl. 514-455.000.

Seebaugh, William R.: *See—*
Bradley, Charles A.; Benge, Herman; Parl, Fritz F.; and Seebaugh, William R., 4,577,514, Cl. 73-863.010.

Segawa, Makoto: *See—*
Ariizumi, Shoji; and Segawa, Makoto, 4,578,694, Cl. 357-41.000.

Segawa, Noboru: *See—*
Ueno, Mitsushi; Shirogami, Tamotsu; and Segawa, Noboru, 4,578,135, Cl. 156-182.000.

Sehgal, Tyag R., to General Electric Company. Probe coil snubber. 4,577,501, Cl. 73-577.000.

Sehlstedt, Per-Olof: *See—*
Edmo, Torbjorn; and Sehlstedt, Per-Olof, 4,577,821, Cl. 248-421.000.

Seibel, Berthold: *See—*
Arnold, Herbert; Horbelt, Michael; Seibel, Berthold; Strobele, Hans-Peter; and Werner, Peter, 4,577,605, Cl. 123-479.000.

Seidel, Udo, to Minnesota Mining and Manufacturing Company. Method for the cleaning of cable ends. 4,578,121, Cl. 134-25.400.

Seigneur, Emile; and Paillart, Philippe. Furniture fastener assembly. 4,577,916, Cl. 312-257.00R.

Seiler, Herbert, to Ciba-Geigy AG. Reactive mono-azo dyes and the preparation and use thereof. 4,578,457, Cl. 534-632.000.

Seimiya, Yasuo: *See—*
Hara, Yoichi; and Seimiya, Yasuo, 4,577,604, Cl. 123-397.000.

Seino, Shuichi: *See—*
Komon, Koichi; Ito, Siro; and Seino, Shuichi, 4,578,290, Cl. 427-421.000.

Seitz, Hans; Pieper, Henner; Frerichs, Udo; and Rach, Heinz-Dieter, to Continental Gummi-Werke Aktiengesellschaft. Vehicle wheel. 4,577,668, Cl. 152-520.000.

Seki, Shojiro, to Nissan Motor Company, Limited. Window regulator mechanism. 4,577,439, Cl. 49-352.000.

Sekiya, Toshiyuki, to Fuji Photo Film Co., Ltd. Presensitized diazo lithographic plate with anodized and silicated aluminum plate surface and subbing layer of polymer with sulfonic acid group. 4,578,342, Cl. 430-159.000.

Selines, Ronald J.: *See—*
Rana, Mahendrasinh D.; and Selines, Ronald J., 4,578,113, Cl. 75-124.000.

Sellstrom, Kathy B.; and Waddill, Harold G., to Texaco Inc. Extended amine curing agents [and epoxy resins cured therewith]. 4,578,412, Cl. 524-243.000.

Sen-Jung, Ch'en. Fluid cushioning apparatus acting as a pivoting medium of two objects having a pivoting feature. 4,578,082, Cl. 623-26.000.

Senga, Akihisa, to Honda Giken Kogyo Kabushiki Kaisha. Intake manifold structure for a V-type internal combustion engine. 4,577,596, Cl. 123-52.0MV.

Senni, Paolo: *See—*
Rossi, Pietro P.; Senni, Paolo; and Ferruzzi, Sergio, 4,578,511, Cl. 562-494.000.

Senno, Harufumi: *See—*
Sakakima, Hiroshi; Satomi, Mitsuo; Yanagiuchi, Yukihiro; and Senno, Harufumi, 4,578,728, Cl. 360-125.000.

Sensitisers (Research) Ltd.: *See—*
Readings, Peter B.; Mihalik, Nandor; and Taylor, Robin, 4,578,341, Cl. 430-155.000.

Seshimoto, Osamu; and Nirasawa, Mitsuharu, to Fuji Photo Film Co., Ltd. Ion selective electrode and method of making ion selective electrodes. 4,578,173, Cl. 204-416.000.

Sestak, Joseph T.: *See—*
Klein, Roy S.; Gehly, Joel C.; and Sestak, Joseph T., 4,578,742, Cl. 362-294.000.

Sexton, James H.: *See—*
Dellinger, Thomas B.; Boston, William G.; Sexton, James H.; and Strong, Robert T., 4,577,700, Cl. 175-40.000.

Seymour, Robert W.: *See—*
Light, Ronald R.; and Seymour, Robert W., 4,578,437, Cl. 525-444.000.

Seymour, Shaun A., to Sperry Corporation. Agricultural mixing and grinding machine. 4,577,805, Cl. 241-101.00B.

Shackelford, Michael L., to Didde Graphic Systems Corporation. Differential drive mechanism. 4,577,527, Cl. 74-640.000.

Shaddock, Roland E.: *See—*
Schmidt, Ronald L.; and Shaddock, Roland E., 4,578,198, Cl. 210-780.000.

Shalaby, W. Shalaby: *See—*
Weaver, Gregory A.; Price, Lester F.; Britt, Crawford R.; and Shalaby, W. Shalaby, 4,578,451, Cl. 528-292.000.

Shannon, John P.: *See—*
Pearlman, Jay S.; and Shannon, John P., 4,578,805, Cl. 378-119.000.

Shapiro, Eugene: *See—*
Mahulikar, Deepak; and Shapiro, Eugene, 4,578,320, Cl. 428-674.000.

Shapiro, Jonathan S., to Raytheon Company. X-ray system tester. 4,578,767, Cl. 364-550.000.

Sharma, Ram A., to General Motors Corporation. Metallothermic reduction of rare earth oxides. 4,578,242, Cl. 420-590.000.

Sharp Kabushiki Kaisha: *See—*
Narukawa, Atsushi, 4,577,953, Cl. 355-3.0BE.

Sharum, Wayne P.: *See—*
Tsao, Sherman H.; and Sharum, Wayne P., 4,578,713, Cl. 358-283.000.

Shaw, Richard G.; and Canterino, Peter J., to Mobil Oil Corporation. Process for improving melt strength of ethylene polymers by treatment with organic peroxide. 4,578,431, Cl. 525-387.000.

Shelburne Incorporated: *See—*
Vizard, David, 4,577,724, Cl. 181-265.000.

Shell Oil Company: *See—*
Davison, Sol, 4,578,430, Cl. 525-387.000.
Gergen, William P.; Lutz, Robert G.; and Gelles, Richard, 4,578,429, Cl. 525-291.000.
Schneider, Julian R.; and Pullen, Gene A., 4,577,978, Cl. 374-45.000.

Shelley, Edwin F. Time independent data transmission system. 4,578,534, Cl. 179-2.00C.

Shepherd, David, to Imperial Chemical Industries PLC. Chromatography columns. 4,578,193, Cl. 210-656.000.

Sheridan, Michael, to Ethylene Corp. Mounting structure for electronic probes. 4,578,170, Cl. 204-400.000.

Shibahara, Yoshihumi; and Komoto, Akira, to Shimadzu Corporation. Weighing scale with a load cell. 4,577,709, Cl. 177-211.000.

Shibamoto, Nobuji: *See—*
Tomita, Yukio; Nabeshima, Kenjiro; and Shibamoto, Nobuji, 4,577,564, Cl. 110-110.000.

Shibata, Tadashi, to Kabushiki Kaisha Toshiba. Method of manufacturing semiconductor memory device having trench memory capacitor. 4,577,395, Cl. 29-576.00C.

Shibata, Yuichi; and Baba, Tadashi, to Nakanishi Dental Mfg. Co., Ltd. Dental handpiece having an optical fiberscope. 4,578,034, Cl. 433-29.000.

Shibaura Denki Kabushiki Kaisha Horikawa Cho Sai Wia Kawasaki: *See—*
Sugimoto, Yasuhiro, 4,578,668, Cl. 340-347.0DA.

Shibuki, Masaru: *See—*
Sugisawa, Ko; Shibuki, Masaru; Imada, Imayoshi; Katada, Jun; Yamamoto, Yozo; Nakajima, Setsuo; Kishi, Toshio; and Sugano, Shozo, 4,578,274, Cl. 426-96.000.

Shick, Lloyd G.: *See—*
Franz, Helmut; Hanlon, James H.; and Shick, Lloyd G., 4,578,203, Cl. 252-49.300.

Shigemori, Daizo; Kunii, Haruo; and Endo, Masaaki, to Kabushiki Kaisha Sankosha. Surge voltage arrester. 4,578,733, Cl. 361-120.000.

Shih, Nan C. Bell lock (II). 4,577,584, Cl. 116-10.000.

Shima, Toshiyuki: *See—*
Teshima, Toru; Aizawa, Masanobu; Yoshida, Mitsunari; Shima, Toshiyuki; and Takeda, Masakazu, 4,578,043, Cl. 445-40.000.

Shimadzu Corporation: *See—*
Shibahara, Yoshihumi; and Komoto, Akira, 4,577,709, Cl. 177-211.000.

Shimamune, Takayuki: *See—*
Asano, Hiroshi; Shimamune, Takayuki; and Hirao, Kazuhiro, 4,578,160, Cl. 204-98.000.

Shimano Industrial Company Limited: *See—*
Kawabe, Yuzo, 4,577,808, Cl. 242-84.50R.

Shimazaki, Kuniya, to Tokyo Shibaura Denki Kabushiki Kaisha. Pattern transfer device and method. 4,577,945, Cl. 353-101.000.

Shimenkov, Marat. Toothpick. 4,577,649, Cl. 132-93.000.

Shimizu, Keizo; Otsu, Shimpei; Fujimura, Toshio; Taniguchi, Yoshisada; and Nagami, Hayashi, to Hitachi, Ltd. Record disc reproducing apparatus. 4,578,787, Cl. 369-77.200.

Shimizu, Nobuyoshi; Fujimoto, Terunori; Inui, Tsuneo; and Ishida, Masatoki, to Toyo Kohan Co., Ltd. Surface treated steel sheet having an excellent weldability and its production method. 4,578,319, Cl. 428-632.000.

Shimizu, Yoshio, to Sony Corporation. Space diversity receiver. 4,578,819, Cl. 455-135.000.

Shimoni, Yair: *See—*
Crawford, Carl R.; Shimoni, Yair; Sohval, A. Robert; and Barnea, Daniel I., 4,578,753, Cl. 364-414.000.

Shinko Electric Co., Ltd.: *See—*
Nakagawa, Hiroshi; and Miwa, Zenichiro, 4,578,622, Cl. 318-135.000.

Shinozaki, Nozomu: *See—*
Neki, Shigeo; Shinozaki, Nozomu; and Dohi, Takashi, 4,578,624, Cl. 318-305.000.

Shionogi & Co., Ltd.: *See—*
Hamashima, Yoshio; Ishikura, Koji; Kubota, Tadatoshi; and Minami, Kyoji, 4,578,378, Cl. 514-210.000.

Shionoya, Masahisa: *See—*
Takahashi, Yukoh; Fujii, Takeo; Shionoya, Masahisa; Yachigo, Shinichi; and Ishii, Tamaki, 4,578,410, Cl. 524-102.000.

Shirahata, Ryuji: *See—*
Ishikuro, Tadashi; Shirahata, Ryuji; Miyoshi, Takahito; and Fujiyama, Masaaki, 4,578,311, Cl. 428-336.000.

Shirogami, Tamotsu: *See—*
Ueno, Mitsushi; Shirogami, Tamotsu; and Segawa, Noboru, 4,578,135, Cl. 156-182.000.

Shishido, Hidesomi, to Molten Corporation. Athletic ball. 4,577,865, Cl. 273-58.00G.

Shop-Vac Corporation: *See—*
Miller, Jonathan; Berfield, Robert C.; and Crevling, Robert L., Jr., 4,577,366, Cl. 15-388.000.

Showalter, Merle R., to Automotive Engine Associates. High swirl very low pollution piston engine employing optimizable vorticity metering. 4,577,602, Cl. 123-306.000.

Shrier, Robert L.: *See—*
Roberts, Lyn M.; Shrier, Robert L.; and Laxton, Raymond, 4,578,700, Cl. 358-84.000.

Shtarkman, Emile M., to Imperial Clevite Inc. Self-stabilizing dry viscous spring damper. 4,577,842, Cl. 267-140.100.

Shuck, David L.; and Knudsen, Irving E., to Westinghouse Electric Corp. Spouted bed blender apparatus. 4,577,972, Cl. 366-101.000.

Shudo, Hirokazu: *See—*
Harigane, Kotaro; Ihara, Keiichi; Ito, Tetsuro; and Shudo, Hirokazu, 4,578,010, Cl. 414-126.000.

Shultz, Walter, to Textron, Inc. Automatic tool changer. 4,577,389, Cl. 29-568.000.

Shupe, Chester D., to Motorola, Inc. Random voltage source with substantially uniform distribution. 4,578,649, Cl. 331-78.000.

Sicka, Richard W.; and Tompkins, Dale A., to Firestone Tire & Rubber Company, The. Coextrusion apparatus. 4,578,024, Cl. 425-114.000.

Sidler, Karl. Safekeeping box assembly. 4,577,563, Cl. 109-52.000.

Siedel, Joachim; Neumann, Ulrich; Ziegenhorn, Joachim; Batz, Hans-Georg; Lenz, Helmut; Pautz, Brigitte; and Albert, Winfried, to Boehringer Mannheim GmbH. Creatinine antibody. 4,578,361, Cl. 436-547.000.

Siegemund, Gunter: *See—*
Muller, Thomas; and Siegemund, Gunter, 4,578,369, Cl. 502-36.000.

Siegmund, Walter P., to Warner-Lambert Technologies, Inc. Gradient index optical components. 4,578,096, Cl. 65-3.110.

Siemens Aktiengesellschaft: *See—*
Kinzler, Hans; and Kaiser, Jurgen, 4,578,664, Cl. 336-90.000.
Kleeberg, Wolfgang; Hauschildt, Klaus-Robert; Hacker, Heinz; and Kretzschmar, Klaus, 4,578,452, Cl. 528-297.000.
Markwitz, Wernhard, 4,578,532, Cl. 178-22.130.
Richter, Walter, 4,578,626, Cl. 318-338.000.
Schultz, Ludwig; and Gaube, Franz, 4,578,123, Cl. 148-11.50Q.
Tihanyi, Jeno ; Fellinger, Christine; and Leipold, Ludwig, 4,578,595, Cl. 307-252.00R.
Tihanyi, Jenoe ; Fellinger, Christine; and Leipold, Ludwig, 4,578,596, Cl. 307-252.00R.
Vollert, Emmeran, 4,578,686, Cl. 346-140.00R.

Siemens Gammasonics, Inc.: *See—*
Gosis, Anatoly I.; and Bartos, Frank J., 4,578,585, Cl. 250-363.00S.

Siemers, Paul A.; Kopp, Robert W.; Jackson, Melvin R.; Duke, Steven R.; Perrin, David P.; and Liu, Ying H., to General Electric Company. Wear resistant gun barrel and method of forming. 4,577,431, Cl. 42-76.00A.

Siewell, Gary L.: *See—*
Cloutier, Frank L.; McClelland, Paul H.; Boucher, William R.; and Siewell, Gary L., 4,578,687, Cl. 346-140.00R.

Sigma-Tau Industrie Farmaceutiche Riunite S.p.A.: *See—*
Baglioni, Alessandro, 4,578,481, Cl. 548-539.000.

Signetics Corporation: *See—*
Allen, Richard J.; and Youden, Richard W., 4,578,637, Cl. 324-73.0PC.
Fang, Sheng; and Rao, Kameswara K., 4,578,777, Cl. 365-184.000.
West, Jeffery A.; and Fletcher, Thomas D., 4,578,602, Cl. 307-475.000.

Sikos, Karoly: *See—*
Csizer, Zoltan; Sikos, Karoly; Bacskai, Laszlo; Joo, Istvan; Niedermayer, Eleonora; Rethy, Lajos; and Zsidai, Jozsef, 4,578,270, Cl. 424-92.000.

Siler, Harold L.: *See—*
Ochs, Charles S.; and Siler, Harold L., 4,578,001, Cl. 406-10.000.

Silka, John L.; and Yeaney, Gerald L., to American Sterilizer Company. Wire rack for processing hard container systems in washing-sterilizers. 4,577,764, Cl. 211-41.000.

Silke, Gerald W.; and Weber, Frank D., to Cyclomatic Industries, Inc. Slope-speed sensor for seam welding apparatus. 4,577,499, Cl. 73-432.00R.

Simmons, Richard M., to Telelogic, Inc. Videotex system. 4,578,535, Cl. 179-2.0DP.

Simon, Gilbert. Machine for peeling, skimming, skinning and/or slicing joints of meat, fishes and the like. 4,577,371, Cl. 17-62.000.

Simon, Mark I.; Cotter, Christopher G.; and Stein-Gelinas, Carolyn, to Spacelabs, Inc. Apparatus and method for automatic lead selection in electrocardiography. 4,577,639, Cl. 128-709.000.

Simonetti, John J., to Sangamo Weston, Inc. High temperature plastic scintillator. 4,578,213, Cl. 252-301.170.

Simonnet, Christian: *See—*
Soula, Gerard; and Simonnet, Christian, 4,578,495, Cl. 556-468.000.

Singer Company, The: *See—*
Franke, John M., Sr., 4,577,792, Cl. 226-162.000.
Stevens, Victor G.; and Huang, Pao-Ter, 4,577,575, Cl. 112-449.000.

Singh, Balwant; and Waterman, Paul S., to American Cyanamid Company. Process for preparing phenylisopropylurea compounds. 4,578,513, Cl. 564-56.000.

Siwiak, Kazimierz, to Motorola Inc. Portable battery powered electrical apparatus with improved battery pack protected against inadvertent short circuit of the battery terminals. 4,578,628, Cl. 320-2.000.

Sjovall, Lasse: *See—*
Lehto, Eino; Moller, Goran; and Sjovall, Lasse, 4,577,997, Cl. 405-43.000.

Skamser, Ingrid, to Thermal Bags by Ingrid, Inc. Thermally insulated food bag. 4,578,814, Cl. 383-99.000.

Skattebol, Lars; and Stenstrom, Yngve, to Borregaard Industries Limited. Process for the preparation of lineatin. 4,578,484, Cl. 549-360.000.

Skroch, David D. Wild mouse cat scratch pole. 4,577,590, Cl. 119-29.000.

Skulnick, Harvey I.; Smith, Herman W.; Smith, Robert J.; and Wierenga, Wendell, to Upjohn Company, The. Processes for the preparation of 6-aryluracils. 4,578,466, Cl. 544-309.000.

Slade, Randall: *See—*
Broadus, Ronnie J.; and Slade, Randall, 4,577,488, Cl. 73-40.000.

Slavin, Michael; and Miller, Ellsworth S., to Lectron Products, Inc. Solenoid assembly. 4,578,662, Cl. 335-262.000.

Slepetys, Richard A.: *See—*
Huege, Fred R.; Slepetys, Richard A.; and Catone, David L., 4,578,118, Cl. 106-288.00B.

Sliwa, John W.; Burt, Roy J.; Lee, Chune; MacKay, John; and Johnson, Cindy A., to Trilogy Computer Development Partners, Ltd. Method for mounting a semiconductor chip. 4,577,398, Cl. 29-590.000.

Smith, David S., to Technicon Instruments Co. Ltd. Specific binding assay conjugate with spaced-apart receptors. 4,578,360, Cl. 436-518.000.

Smith, Geoffrey: *See—*
Ray, Colin J.; and Smith, Geoffrey, 4,577,497, Cl. 73-126.000.

Smith, Harry D., Jr., to Halliburton Company. Gamma spectrum porosity measurement. 4,578,580, Cl. 250-269.000.

Smith, Harry L. O.: *See*—
Fox, Anthony G.; Smith, Harry L. O.; and Sadre-Marandi, Ehsan, 4,577,947, Cl. 354-275.000.
Smith, Herman W.: *See*—
Skulnick, Harvey I.; Smith, Herman W.; Smith, Robert J.; and Wierenga, Wendell, 4,578,466, Cl. 544-309.000.
Smith International, Inc.: *See*—
Cross, Donald G., 4,577,705, Cl. 175-228.000.
Smith, Joseph J.; and Erickson, Paul K., to Deere & Company. Track unit extension for wide track crawler vehicles. 4,577,717, Cl. 180-9.100.
Smith, Maurice R.: *See*—
Moore, Sanders H.; Smith, Maurice R.; and Cochran, Harvey B., 4,578,195, Cl. 210-679.000.
Smith, Nicholas H.: *See*—
Carlson, Robert A.; and Smith, Nicholas H., 4,577,839, Cl. 266-272.000.
Smith, Robert J.: *See*—
Skulnick, Harvey I.; Smith, Herman W.; Smith, Robert J.; and Wierenga, Wendell, 4,578,466, Cl. 544-309.000.
Smith, Ronald D.: *See*—
Springer, Edward A.; and Smith, Ronald D., 4,577,435, Cl. 47-2.000.
Smith, Stephen A.: *See*—
Markwell, Roger E.; and Smith, Stephen A., 4,578,393, Cl. 514-310.000.
Smith, Steve. High-speed feedback circuit. 4,578,631, Cl. 323-282.000.
SmithKline & French Laboratories Limited: *See*—
Durant, Graham J.; and Ganellin, Charon R., 4,578,388, Cl. 514-252.000.
Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,578,459, Cl. 544-8.000.
Smolen, Victor F.: *See*—
Cosgrove, Robert J., Jr.; and Smolen, Victor F., 4,578,244, Cl. 422-65.000.
Smyth, Bruce E.: *See*—
MacFarlane, James W.; and Smyth, Bruce E., 4,578,810, Cl. 382-8.000.
Snap-on Tools Corporation: *See*—
Grover, Donald D.; and Kaufman, Glenn A., 4,577,496, Cl. 73-119.00A.
Quinn, Robert O.; Govekar, Craig F.; and Piehl, James R., 4,578,755, Cl. 364-431.010.
Snia BPD S.p.A.: *See*—
Rossi, Pietro P.; Senni, Paolo; and Ferruzzi, Sergio, 4,578,511, Cl. 562-494.000.
Snow Brand Milk Products Co., Ltd.: *See*—
Taneda, Kozo; Chiba, Masae; Naka, Junichi; and Watanabe, Shunichi, 4,578,002, Cl. 406-28.000.
Snyckers, Friedrich O.: *See*—
Fourie, Theunis G.; Dekker, Theodor G.; Snyckers, Friedrich O.; and van der Schyf, Cornelis J., 4,578,520, Cl. 568-315.000.
Snyder, Robert F., to Raymond Engineering Inc. Self-aligning load transmission post. 4,577,912, Cl. 308-2.00R.
Societa Italiana Vetro SIV S.p.A.: *See*—
Bonacci, Carlo, 4,577,539, Cl. 83-886.000.
Societe Anonyme D.B.A.: *See*—
Gautier, Jean P., 4,577,548, Cl. 91-369.00A.
Societe Anonyme de Telecommunications: *See*—
Colin de Verdiere, Jean-Marc M.; and Langlois, Patrice R., 4,578,544, Cl. 179-170.200.
Societe Anonyme Redoute Catalogue: *See*—
Barillec, Christian; Janvier, Dominique; and Bonneton, Marc, 4,578,013, Cl. 414-323.000.
Societe de Signalisations Automobiles S.E.I.M.A.: *See*—
Krizmanic, Jacky, 4,578,740, Cl. 362-66.000.
Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.": *See*—
Bayle-Laboure, Gerard J. P.; Bouiller, Jean G.; Buisson, Marc F. B.; and Soligny, Marcel R., 4,577,814, Cl. 244-12.500.
Societe Nationale Elf Aquitaine: *See*—
Armand, Michel; Muller, Daniel; Duval, Michel; and Harvey, Paul-Etienne, 4,578,326, Cl. 429-192.000.
Mautref, Michel; and Belouet, Christian, 4,577,588, Cl. 118-665.000.
Societe Nouvelle Construction Metalliques de Provence: *See*—
Puech, Alain, 4,577,581, Cl. 114-294.000.
Soderstrom, Edwin D., III; and Davis, Terrence A., to Phillips Petroleum Company. Reid Vapor Pressure determination and control in fractional distillation. 4,578,151, Cl. 203-1.000.
Sogabe, Ichita, to Nippondenso Co., Ltd.; and Toyota Jidosha Kabushiki Kaisha. Rotary driving apparatus. 4,577,832, Cl. 251-129.110.
Sohval, A. Robert: *See*—
Crawford, Carl R.; Shimoni, Yair; Sohval, A. Robert; and Barnea, Daniel I., 4,578,753, Cl. 364-414.000.
Soligny, Marcel R.: *See*—
Bayle-Laboure, Gerard J. P.; Bouiller, Jean G.; Buisson, Marc F. B.; and ligny, Marcel R., 4,577,814, Cl. 244-12.500.
Solmat Systems Ltd.: *See*—
Assaf, Gad, 4,577,618, Cl. 126-415.000.
Someya, Noboru; and Horikawa, Rikizo, to Tokyo Rika Kikai Co., Ltd. Sampling valve for use in high-speed liquid chromatography. 4,577,515, Cl. 73-863.730.
Soneda, Mitsuo; Fukuzawa, Manami; and Ohtsu, Takaji, to Sony Corporation. Large amplitude pulse generating circuits. 4,578,597, Cl. 307-265.000.
Sonoi, Koji: *See*—
Sumino, Yasuhiro; Sonoi, Koji; and Doi, Muneharu, 4,578,336, Cl. 435-88.000.
Sony Corporation: *See*—
Kubota, Shigeo, 4,577,941, Cl. 350-582.000.
Okanobu, Taiwa, 4,578,807, Cl. 381-7.000.
Shimizu, Yoshio, 4,578,819, Cl. 455-135.000.
Soneda, Mitsuo; Fukuzawa, Manami; and Ohtsu, Takaji, 4,578,597, Cl. 307-265.000.
Sori, Naoyuki: *See*—
Sahashi, Masashi; Inomata, Koichiro; Sori, Naoyuki; and Yamamiya, Hideki, 4,578,125, Cl. 148-31.570.
Soriano, David S.: *See*—
Dimmit, Jeffrey H.; Van Der Puy, Michael; and Soriano, David S., 4,578,250, Cl. 423-22.000.
Sosthene, Daniele: *See*—
Prohaska, Hans; and Sosthene, Daniele, 4,578,741, Cl. 362-249.000.
Soula, Gerard; and Simonnet, Christian, to Rhone-Poulenc Specialties Chimiques. Preparation of organosilanes/organopolysilanes from disilanes. 4,578,495, Cl. 556-468.000.
Southern, Brian K.: *See*—
Wilson, Joseph H.; Rapp, Jeffrey C.; Southern, Brian K.; and Elliott, Martin E., 4,578,185, Cl. 210-85.000.
Spacelabs, Inc.: *See*—
Simon, Mark I.; Cotter, Christopher G.; and Stein-Gelinas, Carolyn, 4,577,639, Cl. 128-709.000.
Spagnoli, Leonardo: *See*—
Clementini, Luciano; and Spagnoli, Leonardo, 4,578,428, Cl. 525-265.000.
Spanier, Henry C., to Nabisco Brands, Inc. Date processing. 4,578,275, Cl. 426-302.000.
Spears, J. Richard, to Beth Israel Hospital Association, The. Method for diagnosis of atherosclerosis. 4,577,636, Cl. 128-654.000.
Special Trustees for St. Thomas' Hospital, The: *See*—
Saundry, Richard H.; and Savidge, Geoffrey F., 4,578,218, Cl. 260-112.00B.
Spencer, David R.; and Goldstein, Amnon, to Data Recording Systems, Inc. Dual mode laser printer. 4,578,689, Cl. 346-160.000.
Speranza, George P.: *See*—
Yeakey, Ernest L.; Speranza, George P.; Triebel, Carol A.; and McCoy, David R., 4,578,205, Cl. 252-76.000.
Speranzin, Claudio; Badiali, Roberto; and Bertoli, Luciano, to Officine Savio S.p.A. Process and apparatus for mechanically splicing yarns. 4,577,459, Cl. 57-22.000.
Sperry Corporation: *See*—
Seymour, Shaun A., 4,577,805, Cl. 241-101.00B.
Spitzer, Wayne A., to Eli Lilly and Company. Inotropic agents. 4,578,387, Cl. 514-249.000.
Sprague Electric Company: *See*—
Higgs, Jacob K.; and Humenick, John, 4,578,692, Cl. 357-27.000.
Sprecher & Schuh AG: *See*—
Suter, Heinz; and Blum, Alex, 4,578,659, Cl. 335-131.000.
Springer, Edward A.; and Smith, Ronald D. Micro-climate temperature control apparatus. 4,577,435, Cl. 47-2.000.
Square D Company: *See*—
Draper, Charles W.; and Franks, Terry E., 4,578,732, Cl. 361-45.000.
Square D Starkstrom GmbH: *See*—
Grunst, Heinz; and Kleine, Heinz, 4,578,549, Cl. 200-76.000.
Srinivasan, Viswanathan; and Hulbert, Matthew H., to International Minerals & Chemical Corp. Process for recovery of uranium from wet process H_3PO_4. 4,578,249, Cl. 423-10.000.
Staat, Karlhans, to Kocks Technik GmbH & Co. Process for production of seamless tube and apparatus for processing seamless tube. 4,577,481, Cl. 72-68.000.
Stabler, Manfred, to Robert Bosch GmbH. Protective element for hand-held power tool. 4,577,526, Cl. 74-609.000.
Staedtler, J. S.: *See*—
Handl, Werner, 4,578,420, Cl. 524-490.000.
Stahl, G. Allan: *See*—
Burns, Lyle D.; and Stahl, G. Allan, 4,578,201, Cl. 252-8.55C.
Stampwala, Suresh S.; French, James C.; Tunac, Josefino B.; Hurley, Timothy R.; and Bunge, Richard H., to Warner-Lambert Company. CL 1565 antibiotic compounds. 4,578,383, Cl. 514-7.000.
Standard Textile Company, Inc.: *See*—
Heiman, Gary L., 4,578,306, Cl. 428-225.000.
Stanley Electric Co., Ltd.: *See*—
Teshima, Toru; Aizawa, Masanobu; Yoshida, Mitsunari; Shima, Toshiyuki; and Takeda, Masakazu, 4,578,043, Cl. 445-40.000.
Starcosa GmbH: *See*—
Bruckner, Harald, 4,578,525, Cl. 568-918.000.
Stark, Johan S. H., to U.S. Philips Corporation. Method for preventing collision of two mutually movable bodies and an apparatus including an arrangement for preventing collision. 4,578,757, Cl. 364-461.000.
Startup, Robert: *See*—
Rummo, Gregory J.; and Startup, Robert, 4,578,488, Cl. 556-56.000.
Staudenmayer, William J.; Chen, Tsang J.; Borsenberger, Paul M.; and Grashof, Hans R., to Eastman Kodak Company. Multilayer photoconductive elements having an acrylonitrile copolymer interlayer. 4,578,333, Cl. 430-60.000.
Staudenmayer, William J.: *See*—
Borsenberger, Paul M.; Regan, Michael T.; and Staudenmayer, William J., 4,578,334, Cl. 430-59.000.

Stauffer Chemical Company: *See*—
Bayer, Arthur C.; Robbins, Jeffrey D.; and Bowler, Donald J., 4,578,224, Cl. 260-502.50F.
Leone-Bay, Andrea; and Timony, Peter E., 4,578,106, Cl. 71-92.000.
Ste Look: *See*—
Bardin, Roland; Bernard, Jean; Peyre, Henri; and Viodet, Patrice, 4,577,887, Cl. 280-628.000.
Stearns Manufacturing Company: *See*—
Evert, Karla R., 4,578,042, Cl. 441-117.000.
Stebbins, Edwin E.: *See*—
Crooke, Arthur W.; Gyles, Colin; and Stebbins, Edwin E., 4,578,640, Cl. 324-115.000.
Stedry, Bernd: *See*—
Geke, Juergen; and Stedry, Bernd, 4,578,208, Cl. 252-135.000.
Stefan, Alexander. Machine wall. 4,577,446, Cl. 52-425.000.
Stehouwer, William J., to A. J. Sparks & Company. Tag manufacturing apparatus. 4,578,139, Cl. 156-384.000.
Stein-Gelinas, Carolyn: *See*—
Simon, Mark I.; Cotter, Christopher G.; and Stein-Gelinas, Carolyn, 4,577,639, Cl. 128-709.000.
Stein Heurtey Ste Anonyme: *See*—
Braud, Yves; and Fromentin, Jean, 4,578,011, Cl. 414-152.000.
Stein, Roland: *See*—
Schlegel, Wolfgang; Wilke, Arthur; and Stein, Roland, 4,577,844, Cl. 269-71.000.
Steinke, Alexander, to Kraftwerk Union Aktiengesellschaft. Spacer for fuel assemblies of water-cooled nuclear reactors. 4,578,239, Cl. 376-441.000.
Steinmeyer, Robert D.: *See*—
Marko, Ollie W.; Steinmeyer, Robert D.; and Rentsch, Stefan, 4,578,494, Cl. 556-452.000.
Stenstrom, Yngve: *See*—
Skattebol, Lars; and Stenstrom, Yngve, 4,578,484, Cl. 549-360.000.
Stephan, Mark C. Casting decoring device. 4,577,671, Cl. 164-401.000.
Sterling, Robert E., to Medical Research Associates, Ltd. #2. Polymeric tubings comprising polysiloxane-modified elastomer compositions. 4,578,413, Cl. 524-269.000.
Stern, Eric W.: *See*—
Amundsen, Alan R.; and Stern, Eric W., 4,578,490, Cl. 556-136.000.
Amundsen, Alan R.; and Stern, Eric W., 4,578,491, Cl. 556-137.000.
Sterns, William G., to ITT Corporation. Broadband four-port TEM mode 180° printed circuit microwave hybrid. 4,578,652, Cl. 333-117.000.
Stetter GmbH: *See*—
Riker, Rudolf, 4,578,189, Cl. 210-253.000.
Stevens, Victor G.; and Huang, Pao-Ter, to Singer Company, The. Four-step buttonhole mechanism for sewing machines. 4,577,575, Cl. 112-449.000.
Stewart Stamping Corp.: *See*—
Phillipson, Walter M., 4,578,545, Cl. 179-178.000.
Stewart-Warner Corporation: *See*—
Grant, John W.; and Ferrari, Francis E., 4,578,574, Cl. 250-202.000.
Stiefel, Werner: *See*—
Engel, Andreas; Schumann, Frank; Stiefel, Werner; and Freistedt, Reinhold, 4,578,052, Cl. 493-11.000.
Stinson, Douglas G.: *See*—
Gupta, Mool C.; and Stinson, Douglas G., 4,578,684, Cl. 346-135.100.
Stipanuk, John M.; Walse, Alan S.; and Regnier, Kent E., to Molex Incorporated. Laminated electrical connector arrangement. 4,577,922, Cl. 339-176.0MP.
Stokes, Kenneth B., to Medtronic, Inc. Drug dispensing body implantable lead employing molecular sieves and methods of fabrication. 4,577,642, Cl. 128-784.000.
Stone, Donald J.: *See*—
Inman, Charles M.; and Stone, Donald J., 4,578,063, Cl. 604-175.000.
Storage Technology Corporation: *See*—
Bray, Stuart W.; Hughes, Timothy C.; and Ariniello, Susan E., 4,577,811, Cl. 242-195.000.
Storage Technology Partners II: *See*—
McIntosh, Robert; Mathews, Harlan P.; Rickert, David W.; Romano, Paul; and Walker, Jerry, 4,578,786, Cl. 369-44.000.
Stork Brabant B.V.: *See*—
Wyser, Johann, 4,577,516, Cl. 73-864.410.
Strangfeld, Reiner, to Georg Rost und Soehne Armaturenfabrik GmbH und Co. KG. Self closing valve. 4,577,029, Cl. 251-15.000.
Stratton, David M., to Morton Metalcraft Company. Portable bathing apparatus. 4,577,354, Cl. 4-585.000.
Stravitz, David M. Assembly of slidably interfitting storage units. 4,577,914, Cl. 312-10.000.
Streeter, James M.: *See*—
Bangerter, Blauer L.; and Streeter, James M., 4,577,861, Cl. 272-96.000.
Stricker, Herbert; Freund, Bernhard; Harwalik, Heribert; Rominger, Karl L.; Darda, Siegfried; Haselbarth, Volkmar; Arndts, Dietrich; Bechtel, Wolf D.; Bozler, Gerhard; Brickl, Rolf; and Gruber, Peter, to Boehringer Ingelheim GmbH. Retard form of pharmaceuticals with insoluble porous diffusion coatings. 4,578,264, Cl. 424-37.000.
Stringham, Glen E.: *See*—
Keller, Jack; and Stringham, Glen E., 4,577,802, Cl. 239-11.000.
Strobele, Hans-Peter: *See*—
Arnold, Herbert; Horbelt, Michael; Seibel, Berthold; Strobele, Hans-Peter; and Werner, Peter, 4,577,605, Cl. 123-479.000.
Strong, Robert T.: *See*—
Dellinger, Thomas B.; Boston, William G.; Sexton, James H.; and Strong, Robert T., 4,577,700, Cl. 175-40.000.
Strope, Daniel J.: *See*—
Kukes, Simon G.; Johnson, Marvin M.; Strope, Daniel J.; and Hogan, Robert J., 4,578,179, Cl. 208-110.000.
Kukes, Simon G.; Hogan, Robert J.; Coombs, Daniel M.; and Strope, Daniel J., 4,578,180, Cl. 208-110.000.
Struk, James R.: *See*—
Chan, Yuen H.; and Struk, James R., 4,578,779, Cl. 365-190.000.
Stuart, Stephen F.: *See*—
Amdahl, Gene M.; Lee, Hsiao-Peng S.; Rawlinson, Stephen J.; and Stuart, Stephen F., 4,578,750, Cl. 364-200.000.
Stupeck, Donald G.: *See*—
Nazarian, Ara W.; and Stupeck, Donald G., 4,578,625, Cl. 318-318.000.
Sturm, Ruger & Company, Inc.: *See*—
Ruger, William B.; and Larson, Lawrence L., 4,577,430, Cl. 42-69.00R.
Sudo, Masatoshi: *See*—
Yutori, Toshiaki; Sudo, Masatoshi; Kato, Takehiko; and Hosogi, Yasuhiro, 4,578,124, Cl. 148-12.00F.
Suga, Masaaki: *See*—
Niikura, Yasuhiro; Morimoto, Yoshiro; Hamada, Hideo; Suga, Masaaki; and Murasugi, Takashi, 4,577,737, Cl. 192-0.032.
Sugano, Shozo: *See*—
Sugisawa, Ko; Shibuki, Masaru; Imada, Imayoshi; Katada, Jun; Yamamoto, Yozo; Nakajima, Setsuo; Kishi, Toshio; and Sugano, Shozo, 4,578,274, Cl. 426-96.000.
Sugano, Toshiyuki: *See*—
Hani, Kiyoshi; Takei, Takako; Kodama, Minekazu; and Sugano, Toshiyuki, 4,578,308, Cl. 428-297.000.
Sugawara, Kiyoshi: *See*—
Takeyama, Kokichi; Sugawara, Kiyoshi; and Fukagawa, Yasuyuki, 4,577,850, Cl. 271-22.000.
Sugihara, Kazuyoshi: *See*—
Tojo, Toru; and Sugihara, Kazuyoshi, 4,578,607, Cl. 310-328.000.
Sugimoto, Michio: *See*—
Morimoto, Nobuyuki; Takatsu, Kozo; and Sugimoto, Michio, 4,578,259, Cl. 423-329.000.
Sugimoto, Yasuhiro, to Shibaura Denki Kabushiki Kaisha Horikawa Cho Sai Wia Kawasaki. Decoder for a D/A converter. 4,578,668, Cl. 340-347.0DA.
Sugino, Takashi: *See*—
Sugiura, Susumu; and Sugino, Takashi, 4,578,714, Cl. 358-283.000.
Sugisawa, Ko; Shibuki, Masaru; Imada, Imayoshi; Katada, Jun; Yamamoto, Yozo; Nakajima, Setsuo; Kishi, Toshio; and Sugano, Shozo, to House Food Industrial Co., Ltd. Process for preparing granular food products. 4,578,274, Cl. 426-96.000.
Sugita, Yutaka: *See*—
Suzuki, Ryo; Sugita, Yutaka; Takeuchi, Teruaki; Kodama, Naoki; Takeshita, Masatoshi; and Umezaki, Hiroshi, 4,578,775, Cl. 365-36.0 0.
Sugiura, Susumu; and Sugino, Takashi, to Canon Kabushiki Kaisha. Halftone image recording apparatus. 4,578,714, Cl. 358-283.000.
Sulzer Brothers Limited: *See*—
Kathriner, Josef, 4,577,666, Cl. 139-450.000.
Suman, George O., to Completion Tool Company. Sequential inflatable packer. 4,577,696, Cl. 166-387.000.
Sumino, Yasuhiro; Sonoi, Koji; and Doi, Muneharu, to Takeda Chemical Industries, Ltd. Producing nucleosides. 4,578,336, Cl. 435-88.000.
Sumino, Yoshitsugu; and Harada, Hiroshi, to Sanshin Kogyo Kabushiki Kaisha. Fish line entering prevention device for marine propeller. 4,578,040, Cl. 440-73.000.
Sumitomo Chemical Company, Limited: *See*—
Saito, Teruo; Asai, Kuniaki; and Hieda, Kazuo, 4,578,427, Cl. 525-150.000.
Takahashi, Yukoh; Fujii, Takeo; Shionoya, Masahisa; Yachigo, Shinichi; and Ishii, Tamaki, 4,578,410, Cl. 524-102.000.
Yoshimura, Masakatsu; Fujii, Takeo; Yachigo, Shinichi; and Ishii, Tamaki, 4,578,472, Cl. 546-188.000.
Sumitomo Electric Industries, Ltd.: *See*—
Tanaka, Gotaro; Fujiwara, Kunio; and Miyajiri, Tetsuo, 4,578,560, Cl. 219-121.0PR.
Sumitomo Heavy Industries Ltd.: *See*—
Oguro, Tadayuki; Yoshimoto, Teturo; and Niki, Hazime, 4,577,733, Cl. 188-217.000.
Sun Hydraulics Corporation: *See*—
DiBartolo, Ernest A., 4,577,831, Cl. 251-93.000.
Sunakawa, Kiyotaka: *See*—
Yamaguchi, Hisao; Kanno, Hideo; Okamiya, Yoshiaki; and Sunakawa, Kiyotaka, 4,578,395, Cl. 514-356.000.
Sunbeam Plastics Corporation: *See*—
Wright, David M., 4,577,770, Cl. 215-252.000.
Survival Technology Inc.: *See*—
Sarnoff, Stanley J.; Calkins, George B.; and Tarello, William R., 4,578,064, Cl. 604-191.000.
Sussman, Marvin L., to Cordis Corporation. Ventricular right angle connector and system. 4,578,057, Cl. 604-9.000.
Suter, Heinz; and Blum, Alex, to Sprecher & Schuh AG. Coupling system between an electromagnetic switch apparatus and an auxiliary contact block releasably mounted thereupon. 4,578,659, Cl. 335-131.000.
Suzue, Seigo: *See*—
Irikura, Tsutomu; Nishino, Keigo; Suzue, Seigo; and Ikeda, Toshiya, 4,578,392, Cl. 514-300.000.

Suzuki, Kooji: *See*—
Tokuyama, Shunji; Suzuki, Kooji; Hirasawa, Kunio; Yoshioka, Yoshio; and Arimatsu, Keiji, 4,578,730, Cl. 361-4.000.
Suzuki, Masaaki: *See*—
Noyori, Ryoji; Suzuki, Masaaki; Yanagisawa, Akira; and Kurozumi, Seizi, 4,578,482, Cl. 549-214.000.
Suzuki, Minoru: *See*—
Murakami, Toshiaki; Enomoto, Yoichi; and Suzuki, Minoru, 4,578,691, Cl. 357-5.000.
Suzuki, Ryo; Sugita, Yutaka; Takeuchi, Teruaki; Kodama, Naoki; Takeshita, Masatoshi; and Umezaki, Hiroshi, to Hitachi, Ltd. Magnetic bubble memory device. 4,578,775, Cl. 365-36.000.
Suzuki, Takashi; Fujimori, Hiroshi; and Odagiri, Masaru, to Matsushita Electric Industrial Co., Ltd. Magnetic recording medium. 4,578,729, Cl. 360-134.000.
Suzuki, Yasuo: *See*—
Ohnishi, Haruo; Yamaguchi, Kazuo; Suzuki, Yasuo; and Mochida, Nobuo, 4,578,400, Cl. 514-460.000.
Swaenepoel, Joseph: *See*—
Rabain, Jacques; and Swaenepoel, Joseph, 4,578,816, Cl. 455-27.000.
Swanstrom, Kenneth A., to Penn Engineering & Manufacturing Corp. Stud for mounting and method of mounting heat sinks on printed circuit boards. 4,577,402, Cl. 29-840.000.
Swenson, Robert D., to Pountain, Melvin D. Shoe tree. 4,577,360, Cl. 12-115.600.
Swier, Willem: *See*—
Racca, Richard F.; Swier, Willem; and Di Maio, Anthony E., 4,577,783, Cl. 222-386.500.
Swift, Gregory W.: *See*—
Migliori, Albert; Swift, Gregory W.; and Garrett, Steven L., 4,577,414, Cl. 33-363.00K.
Swiss Aluminium Ltd.: *See*—
Frischknecht, Bruno; and Wurgler, Rolf, 4,577,672, Cl. 164-428.000.
Sygnator, Henry A., to Illinois Tool Works Inc. Method of manufacturing a drill screw. 4,577,359, Cl. 10-10.00R.
Syntex (U.S.A.) Inc.: *See*—
Armenta, Richard D.; and Gibbons, Ian, 4,578,350, Cl. 435-7.000.
Systemform Datenbelege GmbH: *See*—
Hofmann, Horst; and Reckert, Jurgen, 4,577,789, Cl. 225-100.000.
Szeleny, Istvan: *See*—
Schickaneder, Helmut; Szeleny, Istvan; Morsdorf, Peter; and Ahrens, Kurt H., 4,578,389, Cl. 514-254.000.
Taga Electric Co., Ltd.: *See*—
Mishiro, Shoji, 4,577,500, Cl. 73-579.000.
Tagaya, Ryosaku, to Eisai Co., Ltd. Testing method for subjects to be tested and a device for said method. 4,577,969, Cl. 356-394.000.
Taguchi, Mitsushi: *See*—
Fukui, Kiyoshi; Kakeya, Noboru; and Taguchi, Mitsushi, 4,578,479, Cl. 548-269.000.
Taguchi, Noboru: *See*—
Kizaki, Kanji; Ishii, Hajime; Taguchi, Noboru; and Kuwamoto, Hiroshi, 4,577,480, Cl. 72-8.000.
Tahara, Tetsuya; and Arita, Masafumi, to Yoshitomi Pharmaceutical Industries, Ltd. Indeno(1,2-b)pyrrole derivatives. 4,578,397, Cl. 514-411.000.
Taishin Electric Ind. Co., Ltd.: *See*—
Eguchi, Kenzo; and Kobayashi, Jiro, 4,578,563, Cl. 219-273.000.
Tait, William C., to Minnesota Mining and Manufacturing Company. Distributed capacitance lc resonant circuit. 4,578,654, Cl. 333-175.000.
Takada, Juichiro. Seat belt anchor assembly. 4,577,888, Cl. 280-808.000.
Takagi, Mitiro: *See*—
Nagano, Hiroyuki; Takagi, Mitiro; Kubodera, Noboru; Matsunaga, Isao; Nabata, Hiroyuki; Ohba, Yasuhiro; Sakai, Kazushige; Hata, Shun-ichi; and Uchida, Yasumi, 4,578,465, Cl. 544-285.000.
Takahashi, Ichiro; Okamoto, Goro; and Okahashi, Kazuo, to Mitsubishi Denki Kabushiki Kaisha. Conduit tube of an electrode device for electrically heating underground hydrocarbon resources. 4,577,664, Cl. 138-149.000.
Takahashi, Mitsuru: *See*—
Ishikawa, Nobuo; and Takahashi, Mitsuru, 4,578,222, Cl. 260-413.000.
Takahashi, Yoshitaka, to Janome Sewing Machine Co., Ltd. Electronic sewing machine with a pattern display. 4,577,574, Cl. 112-445.000.
Takahashi, Yukoh; Fujii, Takeo; Shionoya, Masahisa; Yachigo, Shinichi; and Ishii, Tamaki, to Sumitomo Chemical Company, Limited. Piperidine derivatives, their production and stabilized polymer compositions containing same. 4,578,410, Cl. 524-102.000.
Takahashi, Yutaka; and Matsuoka, Hiroshi, to Fuji Photo Film Co., Ltd. Processing solution tank with hinged sections. 4,577,951, Cl. 354-331.000.
Takanashi, Itsuo; Nakagaki, Shintaro; Miyazaki, Kenichi; and Kuriyama, Takashi, to Victor Company of Japan, Limited. Color camera with stripe filter using controlled bias light for dark scene noise improvement. 4,578,699, Cl. 358-44.000.
Takano, Hiroshi, to Mitsuboshi Belting Ltd. Belt-type torque control system. 4,578,050, Cl. 474-17.000.
Takano, Katsuhiko: *See*—
Sawamura, Mitsuharu; Ito, Susumu; Matsushima, Masaaki; Kishi, Hiroyoshi; Sasamori, Eizo; Yoshihara, Satoshi; Iijima, Shigeharu; and Takano, Katsuhiko, 4,578,322, Cl. 428-694.000.
Takano, Masao, to Fuji Photo Film Co., Ltd. Radiation image recording and reproducing system with preferential processing function. 4,578,582, Cl. 250-327.200.
Takano, Mitsuyoshi; and Ando, Mamoru, to Anritsu Electric Co. Ltd. Spectrum analyzer. 4,578,638, Cl. 324-77.00B.
Takara Co., Ltd.: *See*—
Ohno, Kouzin, 4,578,046, Cl. 446-376.000.
Takase, Tadaaki: *See*—
Kitta, Toshiyuki; Abe, Wataru; and Takase, Tadaaki, 4,577,443, Cl. 52-220.000.
Takatsu, Kozo: *See*—
Morimoto, Nobuyuki; Takatsu, Kozo; and Sugimoto, Michio, 4,578,259, Cl. 423-329.000.
Takeda Chemical Industries, Ltd.: *See*—
Nishino, Hiroshi; and Aibe, Toshio, 4,578,256, Cl. 423-210.000.
Sumino, Yasuhiro; Sonoi, Koji; and Doi, Muneharu, 4,578,336, Cl. 435-88.000.
Takeda, Masakazu: *See*—
Teshima, Toru; Aizawa, Masanobu; Yoshida, Mitsunari; Shima, Toshiyuki; and Takeda, Masakazu, 4,578,043, Cl. 445-40.000.
Takei, Takako: *See*—
Hani, Kiyoshi; Takei, Takako; Kodama, Minekazu; and Sugano, Toshiyuki, 4,578,308, Cl. 428-297.000.
Takei, Toshio: *See*—
Ito, Sho; Tatsumi, Kenji; Kasahara, Kumio; Nakaguchi, Tomoyuki; Takei, Toshio; and Nakahara, Shojiro, 4,577,863, Cl. 273-26.00R.
Takemae, Yoshihiro, to Fujitsu Limited. Semiconductor device encapsulating a multi-chip array. 4,578,697, Cl. 357-75.000.
Takemae, Yoshihiro; Nakano, Tomio; and Sato, Kimiaki, to Fujitsu Limited. Dynamic semiconductor memory device. 4,578,776, Cl. 365-149.000.
Takenaka, Yuuichi: *See*—
Yamamoto, Takemi; Kuzuya, Susumu; Kagami, Isao; and Takenaka, Yuuichi, 4,577,984, Cl. 400-625.000.
Takeshita, Masatoshi: *See*—
Suzuki, Ryo; Sugita, Yutaka; Takeuchi, Teruaki; Kodama, Naoki; Takeshita, Masatoshi; and Umezaki, Hiroshi, 4,578,775, Cl. 365-36.000.
Takeuchi, Hajime: *See*—
Ito, Takeo; Ido, Tadashi; Takeuchi, Hajime; Hashimoto, Minoru; Maeda, Tatsumi; and Awa, Masashi, 4,578,313, Cl. 428-403.000.
Takeuchi, Masato: *See*—
Mori, Toshikatsu; Takeuchi, Seizi; Matsuda, Shimpei; Kumagi, Teruo; Kato, Akira; Yamashita, Hisao; and Takeuchi, Masato, 4,578,112, Cl. 75-108.000.
Takeuchi, Seizi: *See*—
Mori, Toshikatsu; Takeuchi, Seizi; Matsuda, Shimpei; Kumagi, Teruo; Kato, Akira; Yamashita, Hisao; and Takeuchi, Masato, 4,578,112, Cl. 75-108.000.
Takeuchi, Teruaki: *See*—
Suzuki, Ryo; Sugita, Yutaka; Takeuchi, Teruaki; Kodama, Naoki; Takeshita, Masatoshi; and Umezaki, Hiroshi, 4,578,775, Cl. 365-36.000.
Takeyama, Kokichi; Sugawara, Kiyoshi; and Fukagawa, Yasuyuki, to Fuji Xerox Co., Ltd. Automatic paper feeder for reproducing machine. 4,577,850, Cl. 271-22.000.
Takikawa, Makito, to Alps Electric Co., Ltd. Carriage drive unit. 4,577,521, Cl. 74-89.200.
Takita, Hitoshi; Noda, Sakuo; Mukaida, Yutaka; and Kobayashi, Hidetoshi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Pharmaceutical composition for treating nephritis and method for treating nephritis. 4,578,404, Cl. 514-567.000.
Talmage, Joseph M.: *See*—
Oksman, Norman H.; Talmage, Joseph M.; and Wells, Henry J., 4,578,358, Cl. 436-66.000.
Oksman, Norman H.; Talmage, Joseph M.; and Wells, Henry J., 4,578,359, Cl. 436-66.000.
Talmon, David K.: *See*—
Talmon, Floyd H.; and Talmon, David K., 4,577,907, Cl. 297-452.000.
Talmon, Floyd H.; and Talmon, David K., to Air-Lock Plastics, Inc. Seat assembly. 4,577,907, Cl. 297-452.000.
Tam, Andrew C.: *See*—
Imaino, Wayne I.; and Tam, Andrew C., 4,577,503, Cl. 73-602.000.
Tamerlane Corporation: *See*—
Schoch, Donald C.; and Engelmann, Albert C., 4,578,318, Cl. 428-615.000.
Tamura, Masaru: *See*—
Hanada, Koji; Kinoshita, Yuji; and Tamura, Masaru, 4,578,660, Cl. 335-133.000.
Tan, Yoichi: *See*—
Satoh, Takane; and Tan, Yoichi, 4,578,797, Cl. 375-25.000.
Tanabe, Hisaki: *See*—
Umemoto, Hirotoshi; Tanabe, Hisaki; Kanakura, Akihiro; and Nakano, Shinji, 4,578,436, Cl. 525-443.000.
Tanaka, Gotaro; Fujiwara, Kunio; and Miyajiri, Tetsuo, to Sumitomo Electric Industries, Ltd. High frequency induction coupled plasma torch with concentric pipes having flanges thereon. 4,578,560, Cl. 219-121.0PR.
Tanaka, Hideto; and Fujisawa, Kyuichi, to Alps Electric Co., Ltd. Pen changeover mechanism for pen recorder. 4,578,685, Cl. 346-139.00R.
Tanaka, Hiroshi; and Baba, Hidetoshi, to NGK Spark Plug Co., Ltd. Nitride based cutting tool and method for producing the same. 4,578,087, Cl. 51-295.000.
Tanaka, Hiroshi; and Kato, Hisatoyo, to Fuji Photo Film Co., Ltd. Radiation image read-out method and apparatus. 4,578,581, Cl. 250-327.200.

Tanaka, Motoaki: *See*—
Imai, Kazuhiro; Ogata, Hiroshi; Tanaka, Motoaki; Nawa, Hiroyoshi; and Ishihara, Masami, 4,578,499, Cl. 560-21.000.

Tanaka, Tsuneo: *See*—
Haga, Kyosuke; and Tanaka, Tsuneo, 4,577,660, Cl. 137-625.240.

Tanaka, Yasunori; and Noda, Shinji, to Fuji Photo Film Co., Ltd. Apparatus for removing foreign matter from flexible support. 4,577,362, Cl. 15-256.500.

Taneda, Kozo; Chiba, Masae; Naka, Junichi; and Watanabe, Shunichi, to Snow Brand Milk Products Co., Ltd. Transport apparatus for flat articles. 4,578,002, Cl. 406-28.000.

Tanel, Michael L. Athletic shoe with improved pivot cleating. 4,577,422, Cl. 36-126.000.

Taniguchi, Yoshisada: *See*—
Shimizu, Keizo; Otsu, Shimpei; Fujimura, Toshio; Taniguchi, Yoshisada; and Nagami, Hayashi, 4,578,787, Cl. 369-77.200.

Taravella, Jody J.: *See*—
Astley, Vivian C.; Milan, Rudolph R.; and Taravella, Jody J., 4,577,804, Cl. 241-16.000.

Tarello, William R.: *See*—
Sarnoff, Stanley J.; Calkins, George B.; and Tarello, William R., 4,578,064, Cl. 604-191.000.

Tarman, Paul B., to Institute of Gas Technology. Fuel production by free fall countercurrent flow. 4,578,176, Cl. 208-8.00R.

Tashiro, Seiki: *See*—
Kawata, Hiroitsu; Ohmura, Tadayoshi; Hasumi, Shunji; Konno, Yutaka; Aruga, Masayoshi; Tashiro, Seiki; Konno, Toshimitsu; and Iwai, Ken, 4,578,391, Cl. 514-256.000.

Taszarek, Bruce J.: *See*—
Junker, Warren R.; Taszarek, Bruce J.; and Chizmar, David A., 4,578,643, Cl. 324-202.000.

Tatsumi, Kenji: *See*—
Ito, Sho; Tatsumi, Kenji; Kasahara, Kumio; Nakaguchi, Tomoyuki; Takei, Toshio; and Nakahara, Shojiro, 4,577,863, Cl. 273-26.00R.

Taylor, Robin: *See*—
Readings, Peter B.; Mihalik, Nandor; and Taylor, Robin, 4,578,341, Cl. 430-155.000.

TDK Corporation: *See*—
Harigane, Kotaro; Ihara, Keiichi; Ito, Tetsuro; and Shudo, Hirokazu, 4,578,010, Cl. 414-126.000.
Ohta, Hiroshi; Abe, Shinji; and Fukushima, Kiyoto, 4,578,314, Cl. 428-403.000.

Technicon Instruments Co. Ltd.: *See*—
Smith, David S., 4,578,360, Cl. 436-518.000.

Teigen, Bard C., to Combustion Engineering, Inc. Waterwall tube orifice mounting assembly. 4,577,593, Cl. 122-235.00D.

Teijin Limited: *See*—
Noyori, Ryoji; Suzuki, Masaaki; Yanagisawa, Akira; and Kurozumi, Seizi, 4,578,482, Cl. 549-214.000.
Yamaguchi, Hisao; Kanno, Hideo; Okamiya, Yoshiaki; and Sunakawa, Kiyotaka, 4,578,395, Cl. 514-356.000.

Tektronix, Inc.: *See*—
Anderson, Russell Y., 4,578,666, Cl. 340-146.200.
Hollister, Allen L., 4,578,667, Cl. 340-347.0SH.

Teledyne, Inc.: *See*—
Coulter, Leland E., 4,578,554, Cl. 219-121.0LC.

Telefunken electronic GmbH: *See*—
Schmidt, Wilfried, 4,577,393, Cl. 29-572.000.

Telelogic, Inc.: *See*—
Simmons, Richard M., 4,578,535, Cl. 179-2.0DP.

Telettra-Telefonia Elettronica e Radio S.p.A. Corso Buenos Aires: *See*—
Molo, Francesco; Cucchi, Silvio; and Cariolaro, Gianfranco, 4,578,790, Cl. 370-50.000.

Terakura, Yukio: *See*—
Ikemoto, Kazuhito; Terakura, Yukio; and Miyake, Takashi, 4,577,525, Cl. 74-440.000.

Terano, Hiroshi: *See*—
Kiyoto, Sumio; Nishikawa, Motoaki; Iwami, Morita; Terano, Hiroshi; and Kohsaka, Masanobu, 4,578,271, Cl. 424-117.000.

Teraoka Seiko Co., Ltd.: *See*—
Nakajima, Toshio, 4,578,140, Cl. 156-384.000.

Terashita, Takaaki, to Fuji Photo Film Co., Ltd. Photometric condition correcting method for photographic film. 4,577,961, Cl. 355-77.000.

Terrenzio, Gabriel M., to Acrowood Corporation. Impeller assembly for an impact crusher. 4,577,806, Cl. 241-275.000.

Teshima, Toru; Aizawa, Masanobu; Yoshida, Mitsunari; Shima, Toshiyuki; and Takeda, Masakazu, to Stanley Electric Co., Ltd. Method and apparatus for manufacturing light bulb with bead sealing gas. 4,578,043, Cl. 445-40.000.

Tetra Pak Developpement S.A.: *See*—
Reil, Wilhelm, 4,578,004, Cl. 408-87.000.

Texaco Inc.: *See*—
Gassmann, Zean Z.; Hawkins, Jeffrey T.; and Brown, Alfred, 4,577,688, Cl. 166-245.000.
Huang, Wann-Sheng; and Chien, Sze-Foo, 4,577,691, Cl. 166-263.000.
Lin, Chew-Chen; and Lankford, Frank L., Jr., 4,578,578, Cl. 250-252.100.
Sellstrom, Kathy B.; and Waddill, Harold G., 4,578,412, Cl. 524-243.000.
Vanderpool, Steven H.; and Watts, Lewis W., Jr., 4,578,518, Cl. 564-479.000.
Yeakey, Ernest L.; Speranza, George P.; Triebel, Carol A.; and McCoy, David R., 4,578,205, Cl. 252-76.000.

Texaco Inc. (Parent): *See*—
Larken, John M.; and Vanderpool, Steven H., 4,578,519, Cl. 564-479.000.

Texas Instruments Incorporated: *See*—
Haken, Roger A., 4,577,390, Cl. 29-570.000.

Textron, Inc.: *See*—
Shultz, Walter, 4,577,389, Cl. 29-568.000.

Th. Goldschmidt AG: *See*—
Rott, Hans; Koerner, Gotz; and Schmidt, Gunter, 4,578,116, Cl. 106-18.120.

Theeuwes, Felix: *See*—
Urquhart, John; and Theeuwes, Felix, 4,578,075, Cl. 604-892.000.

Thermal Bags by Ingrid, Inc.: *See*—
Skamser, Ingrid, 4,578,814, Cl. 383-99.000.

Thevenot, Gilles: *See*—
Voss, Josef; and Thevenot, Gilles, 4,577,589, Cl. 119-17.000.

Thomas, Alan F.: *See*—
Morris, Anthony F.; Delay, Francois; Gautschi, Fritz; Thomas, Alan F.; Giersch, Wolfgang K.; and Boschung, Andre , 4,578,277, Cl. 426-538.000.

Thomas, Mario L.: *See*—
van Rijsewijk, Lambertus J. J.; Thomas, Mario L.; Meijer, Henricus J. J. C.; and van der Wilk, Ronald, 4,578,661, Cl. 335-212.000.

Thomson-Brandt: *See*—
Pissot, Guy, 4,578,047, Cl. 464-30.000.

Thomson-CSF: *See*—
Etienne, Jean-Luc; and Cruchon, Jean-Claude, 4,578,655, Cl. 333-202.000.
Klausz, Remy, 4,578,752, Cl. 364-414.000.
Lacour, Clement-Francois; and Janer, Patrick, 4,578,656, Cl. 333-204.000.
Rabain, Jacques; and Swaenepoel, Joseph, 4,578,816, Cl. 455-27.000.
Rabain, Jacques; and Adrian, Serge, 4,578,817, Cl. 455-27.000.
Urien, Jacques; Bressan, Elie; Danguy, Jacques; and Narzul, Marcel, 4,578,658, Cl. 333-227.000.

Thyssen-Bornemisza, Inc., (TBG Inc.): *See*—
Borsh, Richard J.; Ripley, Robert W.; and Pate, Harold T., 4,578,528, Cl. 174-65.00G.

Tiedje, J. Thomas, to Exxon Research and Engineering Co. System for measuring carrier lifetime of semiconductor wafers. 4,578,641, Cl. 324-158.00D.

Tietjen, Marlene; Brown, Ivonne; and Macchio, Ralph A., to Revlon, Inc. Silicone-based cosmetic products containing pigment. 4,578,266, Cl. 424-63.000.

Tietjens, Eduard W., to U.S. Philips Corporation. Hair-cutting device. 4,577,408, Cl. 30-222.000.

Tihanyi, Jeno ; Fellinger, Christine; and Leipold, Ludwig, to Siemens Aktiengesellschaft. Circuit arrangement for drive of a thyristor with light. 4,578,595, Cl. 307-252.00R.

Tihanyi, Jenoe ; Fellinger, Christine; and Leipold, Ludwig, to Siemens Aktiengesellschaft. Circuit arrangement for driving a thyristor with a phototransistor. 4,578,596, Cl. 307-252.00R.

Timony, Peter E.: *See*—
Leone-Bay, Andrea; and Timony, Peter E., 4,578,106, Cl. 71-92.000.

Tipping, Donald W.: *See*—
Fisher, Robert W.; Maroone, James P.; Tipping, Donald W.; and Zanner, Frank J., 4,578,795, Cl. 373-70.000.

Tobback, Hubert J.: *See*—
Verhoeven, Constant T.; Tobback, Hubert J.; and Dompas, John M., 4,577,401, Cl. 29-825.000.

Toda, Akitoshi; and Mimura, Yoshiyuki, to Olympus Optical Co., Ltd. Method of removing electrostatic charge from electrophotographic photosensitive device. 4,578,332, Cl. 430-55.000.

Tojo, Toru; and Sugihara, Kazuyoshi, to Kabushiki Kaisha Toshiba. Piezoelectric precise rotation mechanism for slightly rotating an object. 4,578,607, Cl. 310-328.000.

Tokunaga, Noriyasu, to Kabushiki Kaisha Komatsu Seisakusho. Power transmission arrangement for a hydrostatically driven vehicle. 4,577,714, Cl. 180-70.100.

Tokuno, Masateru; Sawada, Tetsuya; and Mori, Yasuharu, to Rengo Co., Ltd. Control system for blank presser. 4,577,746, Cl. 198-462.000.

Tokuyama, Shunji; Suzuki, Kooji; Hirasawa, Kunio; Yoshioka, Yoshio; and Arimatsu, Keiji, to Hitachi, Ltd. High-voltage DC circuit breaker apparatus. 4,578,730, Cl. 361-4.000.

Tokyo Ohka Kogyo Co., Ltd.: *See*—
Hijikata, Isamu; Uehara, Akira; and Nakane, Hisashi, 4,578,559, Cl. 219-121.0PE.

Tokyo Rika Kikai Co., Ltd.: *See*—
Someya, Noboru; and Horikawa, Rikizo, 4,577,515, Cl. 73-863.730.

Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Ariizumi, Shoji; and Segawa, Makoto, 4,578,694, Cl. 357-41.000.
Gomei, Yoshio, 4,578,236, Cl. 376-136.000.
Horii, Tetsuo, 4,578,759, Cl. 364-478.000.
Komatsu, Shigeru; Inoue, Hiroshi; and Nakamura, Michio, 4,577,397, Cl. 29-576.00B.
Sahashi, Masashi; Inomata, Koichiro; Sori, Naoyuki; and Yamamiya, Hideki, 4,578,125, Cl. 148-31.570.
Shimazaki, Kuniya, 4,577,945, Cl. 353-101.000.
Ueno, Mitsushi; Shirogami, Tamotsu; and Segawa, Noboru, 4,578,135, Cl. 156-182.000.
Watanabe, Junji, 4,577,849, Cl. 271-9.000.

Tokyo Shibauru Denki Kabushiki Kaisha: *See*—
Ito, Takeo; Ido, Tadashi; Takeuchi, Hajime; Hashimoto, Minoru; Maeda, Tatsumi; and Awa, Masashi, 4,578,313, Cl. 428-403.000.
Tokyo Yogyo Kabushiki Kaisha: *See*—
Wakabayashi, Senzo, 4,577,785, Cl. 222-598.000.
Tolksdorf, Wolfgang: *See*—
Heitmann, Heinrich; Tolksdorf, Wolfgang; Welz, Fritz; and Witter, Klaus, 4,578,651, Cl. 332-7.510.
Tomita, Takao, to Honda Giken Kogyo Kabushiki Kaisha. Method and apparatus for supplying fuel to internal combustion engine. 4,577,597, Cl. 123-73.00A.
Tomita, Yukio; Nabeshima, Kenjiro; and Shibamoto, Nobuji, to Hitachi Zosen Corporation. Apparatus for feeding waste tire chips. 4,577,564, Cl. 110-110.000.
Tomiyama, Tsuyoshi, to Kotobuki Seiyaku Company Limited. Thiazole derivatives and procedure of synthesis thereof. 4,578,478, Cl. 548-193.000.
Tomlinson, Ronald S., to Heil-Quaker Corporation. Heat pipe central furnace. 4,577,615, Cl. 126-99.00A.
Tomomatsu, Hideo, to Quaker Oats Company. Preparing yeast bakery product flavors. 4,578,272, Cl. 426-18.000.
Tompkins, Dale A.: *See*—
Sicka, Richard W.; and Tompkins, Dale A., 4,578,024, Cl. 425-114.000.
Toray Industries, Inc.: *See*—
Ohigashi, Hiroji; Koga, Keiko; and Nakanishi, Toshiharu, 4,578,442, Cl. 526-255.000.
Toray Silicone Co., Ltd.: *See*—
Kakinoki, Hideo; and Ona, Isao, 4,578,084, Cl. 8-115.610.
Torbjorn Edmo AB: *See*—
Edmo, Torbjorn; and Sehlstedt, Per-Olof, 4,577,821, Cl. 248-421.000.
Torregrossa, Louis O.: *See*—
Prough, J. Robert; and Torregrossa, Louis O., 4,577,974, Cl. 366-307.000.
Torrington Company, The: *See*—
Fredericksen, Arnold E.; and Richtmeyer, Robert D., 4,577,911, Cl. 308-2.00R.
Toshiba Medical Supply Co., Ltd.: *See*—
Eguchi, Kenzo; and Kobayashi, Jiro, 4,578,563, Cl. 219-273.000.
Tournier, Jean-Louis, to Compagnie Generale des Etablissements Michelin. Material intended to form a joint between two bodies on the outside of their interface, methods of producing assemblies with such material; assemblies thus obtained. 4,578,421, Cl. 524-511.000.
Touya, Osamu: *See*—
Miyazaki, Senji; and Touya, Osamu, 4,578,296, Cl. 428-35.000.
Townsing, Leslie C., to Remote Interrogations Pty. Ltd. Interrogation device. 4,578,539, Cl. 179-2.00A.
Toyo Boseki Kabushiki Kaisha: *See*—
Uno, Keiichi; Nagano, Hikoichi; and Ikegami, Tadashi, 4,578,166, Cl. 8-115.520.
Toyo Kohan Co., Ltd.: *See*—
Shimizu, Nobuyoshi; Fujimoto, Terunori; Inui, Tsuneo; and Ishida, Masatoki, 4,578,319, Cl. 428-632.000.
Toyo Soda Manufacturing Co., Ltd.: *See*—
Ishikawa, Nobuo; and Takahashi, Mitsuru, 4,578,222, Cl. 260-413.000.
Toyoda Gosei Co., Ltd.: *See*—
Nakazawa, Takaaki; Kazaoka, Kenichi; Okazaki, Nobuo; and Nakashima, Kunihiko, 4,578,592, Cl. 307-10.00R.
Toyoda, Hiroshi: *See*—
Harada, Shinichi; Toyoda, Hiroshi; Honma, Katsuhiko; and Matsushita, Shigeru, 4,577,674, Cl. 164-448.000.
Toyoda Koki Kabushiki Kaisha: *See*—
Haga, Kyosuke; and Tanaka, Tsuneo, 4,577,660, Cl. 137-625.240.
Toyota Jidosha Kabushiki Kaisha: *See*—
Ikemoto, Kazuhito; Terakura, Yukio; and Miyake, Takashi, 4,577,525, Cl. 74-440.000.
Sogabe, Ichita, 4,577,832, Cl. 251-129.110.
Traina, Vincenzo. Apparatus to evaluate objectively the concentration and motility of particles suspended in a sample of liquid with data processor and display of the results. 4,577,963, Cl. 356-28.500.
Trame, Charles E., to Everbrite Electric Signs, Inc. Display device with movable tape assemblies. 4,577,428, Cl. 40-518.000.
Traub GmbH: *See*—
Franz, Wiesner, 4,577,416, Cl. 33-561.000.
Trementozzi, Quirino A.: *See*—
Deets, Gary L.; and Trementozzi, Quirino A., 4,578,423, Cl. 525-68.000.
Tri-Med Inc.: *See*—
Wong, Jacob Y., 4,578,762, Cl. 364-497.000.
Triebel, Carol A.: *See*—
Yeakey, Ernest L.; Speranza, George P.; Triebel, Carol A.; and McCoy, David R., 4,578,205, Cl. 252-76.000.
Trilogy Computer Development Partners, Ltd.: *See*—
Sliwa, John W.; Burt, Roy J.; Lee, Chune; MacKay, John; and Johnson, Cindy A., 4,577,398, Cl. 29-590.000.
Trip-Saver Inc.: *See*—
Heitkamp, Lawrence F., III; and Heitkamp, John J., Jr., 4,578,041, Cl. 441-30.000.
Trivedi, Viren P., to Mobil Oil Corporation. Flame retardant high impact poly paramethylstyrene compositions. 4,578,416, Cl. 524-371.000.
Troutner, Vernon H.: *See*—
King, Martin J.; and Troutner, Vernon H., 4,578,056, Cl. 604-6.000.
TRW Ehrenreich GmbH & Co., KG: *See*—
Gollub, Erwin; and Muller, Reinhardt, 4,577,988, Cl. 403-140.000.
Ito, Eiichi, 4,577,989, Cl. 403-140.000.
TRW Inc.: *See*—
Chen, Bor-Uei, 4,578,791, Cl. 372-50.000.
Rezek, Edward A.; and Zinkiewicz, Lawrence M., 4,578,126, Cl. 148-171.000.
Tsai, Tsu-Tzu; and Arnold, Fred E., to United States of America, Air Force. Method for making heterocyclic block copolymer. 4,578,432, Cl. 525-432.000.
Tsai, Tsu-Tzu; and Arnold, Fred E., to United States of America, Air Force. Method for making heterocyclic block copolymer. 4,578,434, Cl. 525-432.000.
Tsai, Tsu-Tzu; and Arnold, Fred E., to United States of America, Air Force. Method for making heterocyclic block copolymer. 4,578,435, Cl. 525-432.000.
Tsao, Sherman H.; and Sharum, Wayne P., to Mead Corporation, The. Multiple mode binary image processing. 4,578,713, Cl. 358-283.000.
Tsuge, Norihisa: *See*—
Ogawa, Junji; Nakano, Tomio; Nakano, Masao; Tsuge, Norihisa; and Horii, Takashi, 4,578,781, Cl. 365-203.000.
Tsujikado, Seiji: *See*—
Abe, Riichi; Tsuruta, Katsuji; and Tsujikado, Seiji, 4,578,748, Cl. 364-167.000.
Tsukutani, Seiichi; and Nakada, Naoki, to Matsishita Electric Industrial Co. Burn-out preventive circuit for commutatorless motor. 4,578,623, Cl. 318-254.000.
Tsuruta, Katsuji: *See*—
Abe, Riichi; Tsuruta, Katsuji; and Tsujikado, Seiji, 4,578,748, Cl. 364-167.000.
Tsuzuki, Hanzou, to Casio Computer Co., Ltd. Data reader. 4,578,568, Cl. 235-436.000.
Tunac, Josefino B.: *See*—
Stampwala, Suresh S.; French, James C.; Tunac, Josefino B.; Hurley, Timothy R.; and Bunge, Richard H., 4,578,383, Cl. 514-7.000.
Turner, Trueman D., to Plasmafusion, Inc. Liquid stabilized plasma burner having flexible cathode holder. 4,578,557, Cl. 219-121.0PP.
Turney, John R.: *See*—
Kunter, Richard S.; and Turney, John R., 4,578,163, Cl. 204-110.000.
Tyler Refrigeration Corporation: *See*—
Ibrahim, Fayez F.; and Bowman, Edward E., 4,577,467, Cl. 62-82.000.
Ube Industries, Ltd.: *See*—
Fukui, Kiyoshi; Kakeya, Noboru; and Taguchi, Mitsushi, 4,578,479, Cl. 548-269.000.
Uchida, Minoru; Komastu, Makoto; and Nakagawa, Kazuyuki, to Otsuka Pharmaceutical Co., Ltd. Carbostyril derivatives. 4,578,381, Cl. 514-233.000.
Uchida, Shunsuke: *See*—
Kitamura, Masao; Nakayama, Norio; Katsura, Ryoei; Ibe, Hidefumi; and Uchida, Shunsuke, 4,578,154, Cl. 204-1.00T.
Uchida, Tetsuo: *See*—
Sato, Yoshiyuki; Isozaki, Akio; Higo, Tomio; and Uchida, Tetsuo, 4,577,381, Cl. 29-157.400.
Uchida, Yasumi: *See*—
Nagano, Hiroyuki; Takagi, Mitiro; Kubodera, Noboru; Matsunaga, Isao; Nabata, Hiroyuki; Ohba, Yasuhiro; Sakai, Kazushige; Hata, Shun-ichi; and Uchida, Yasumi, 4,578,465, Cl. 544-285.000.
Uchimura, Kiyoshi: *See*—
Miki, Yutaka; Nozoe, Toshiro; and Uchimura, Kiyoshi, 4,578,698, Cl. 358-22.000.
Uchiyama, Mitsuo: *See*—
Matsui, Yukio; and Uchiyama, Mitsuo, 4,578,164, Cl. 204-129.550.
Uda, Hiroshi: *See*—
Nakano, Akihiko; Matsumoto, Hitoshi; Uda, Hiroshi; Komatsu, Yasumasa; Kuribayashi, Kiyoshi; and Ikegami, Seiji, 4,578,526, Cl. 136-251.000.
Uehara, Akira: *See*—
Hijikata, Isamu; Uehara, Akira; and Nakane, Hisashi, 4,578,559, Cl. 219-121.0PE.
Uemura, Toyohide: *See*—
Miyazaki, Kazuhide; Uemura, Toyohide; and Nakaso, Katsuzo, 4,578,109, Cl. 75-0.50C.
Ueno, Masahito, to Diesel Kiki Co., Ltd. Apparatus for controlling the speed of a vehicle with internal combustion engine. 4,577,718, Cl. 180-179.000.
Ueno, Masakazu; and Ichimura, Takeshige, to Director-General of Agency of Industrial Science and Technology. Thin film semiconductor device. 4,578,696, Cl. 357-59.000.
Ueno, Mitsushi; Shirogami, Tamotsu; and Segawa, Noboru, to Tokyo Shibaura Denki Kabushiki Kaisha. Fuel cell electrolyte matrix and method for manufacturing the same. 4,578,135, Cl. 156-182.000.
Ulster Polytechnic: *See*—
Currie, Brian; Gardiner, Thomas; and Green, Henry M., 4,578,301, Cl. 428-109.000.
Umemoto, Hirotoshi; Tanabe, Hisaki; Kanakura, Akihiro; and Nakano, Shinji, to Nippon Paint Co., Ltd. Coating resincus composition containing saturated alicyclic acid modified amphoteric polyester resin. 4,578,436, Cl. 525-443.000.
Umemura, Toshikaju: *See*—
Sakurai, Masanori; Miyawaki, Junichi; Umemura, Toshikaju; Kawata, Toshikatsu; and Kiboshi, Shinji, 4,578,422, Cl. 524-593.000.

Umezaki, Hiroshi: *See—*
Suzuki, Ryo; Sugita, Yutaka; Takeuchi, Teruaki; Kodama, Naoki; Takeshita, Masatoshi; and Umezaki, Hiroshi, 4,578,775, Cl. 365-36.000.

Union Carbide Corporation: *See—*
Brode, George L.; and Chow, Sui-Wu, 4,578,448, Cl. 528-139.000.
D'Silva, Themistocles Damasceno J., 4,578,402, Cl. 514-521.000.
Keen, Brian T., 4,578,524, Cl. 568-867.000.
Rana, Mahendrasinh D.; and Selines, Ronald J., 4,578,113, Cl. 75-124.000.

Union Oil Company of California: *See—*
Fenton, Donald M., 4,578,375, Cl. 502-230.000.
Larter, Stephen R., 4,578,356, Cl. 436-31.000.

United Kingdom Atomic Energy Authority: *See—*
Poole, Michael J.; and Crook, Michael J., 4,577,506, Cl. 73-633.000.
Rosevear, Alan; and Lambe, Christopher A., 4,578,351, Cl. 435-41.000.

United States of America
Agriculture: *See—*
Frank, Arlen W., 4,578,506, Cl. 560-148.000.
Lambert, Allan H.; Keating, Esmond J.; and Verburg, Gerald B., 4,577,476, Cl. 68-5.00D.
Air Force: *See—*
Bur, Anthony J.; and Roth, Steven C., 4,577,510, Cl. 73-708.000.
Connon, Thomas R., 4,577,347, Cl. 2-6.000.
Fielding, Lawrence E., 4,577,891, Cl. 285-62.000.
Haupt, Randy L., 4,578,680, Cl. 343-703.000.
O'Driscoll, Peter F., 4,577,542, Cl. 86-20.00D.
Platus, Daniel H., 4,577,812, Cl. 244-3.210.
Schack, Carl J.; and Christe, Karl O., 4,578,225, Cl. 260-550.000.
Tsai, Tsu-Tzu; and Arnold, Fred E., 4,578,432, Cl. 525-432.000.
Tsai, Tsu-Tzu; and Arnold, Fred E., 4,578,434, Cl. 525-432.000.
Tsai, Tsu-Tzu; and Arnold, Fred E., 4,578,435, Cl. 525-432.000.
Army: *See—*
Hollinger, Jeffrey O., 4,578,384, Cl. 514-8.000.
Energy: *See—*
Fisher, Robert W.; Maroone, James P.; Tipping, Donald W.; and Zanner, Frank J., 4,578,795, Cl. 373-70.000.
Korenko, Michael K., 4,578,130, Cl. 148-419.000.
Migliori, Albert; Swift, Gregory W.; and Garrett, Steven L., 4,577,414, Cl. 33-363.00K.
Health and Human Services: *See—*
Rosenberg, Martin, 4,578,355, Cl. 435-317.000.
National Aeronautics and Space Administration: *See—*
Hurd, William J., 4,578,678, Cl. 343-357.000.
Navy: *See—*
Caddy, Michael J., 4,578,766, Cl. 364-521.000.
Divecha, Amarnath P.; Karmarkar, Subhash D.; and Foltz, John V., 4,578,287, Cl. 427-250.000.
Gray, Henry F.; and Greene, Richard F., 4,578,614, Cl. 313-309.000.
Lewis, Bernard L., 4,578,677, Cl. 343-17.2PC.
Meekins, John F.; and Gursky, Herbert, 4,578,804, Cl. 378-84.000.

U.S. Philips Corporation: *See—*
Bartlett, Brian E.; Harris, James E.; and Wilkes, John G., 4,578,145, Cl. 156-616.00R.
Beitler, Franz, 4,578,724, Cl. 360-85.000.
Clarisse, Eddy J., 4,577,818, Cl. 248-27.300.
Claydon, Martin, 4,578,818, Cl. 455-110.000.
Heitmann, Heinrich; Tolksdorf, Wolfgang; Welz, Fritz; and Witter, Klaus, 4,578,651, Cl. 332-7.510.
Muller, Johannes C. A., 4,578,725, Cl. 360-85.000.
Posthuma de Boer, Abe; and Vegt, Jan W., 4,578,613, Cl. 310-800.000.
Stark, Johan S. H., 4,578,757, Cl. 364-461.000.
Tietjens, Eduard W., 4,577,408, Cl. 30-222.000.
van Rijsewijk, Lambertus J. J.; Thomas, Mario L.; Meijer, Henricus J. J. C.; and van der Wilk, Ronald, 4,578,661, Cl. 335-212.000.

United States Steel Corporation: *See—*
Brouse, S. Bernard, 4,577,554, Cl. 100-26.000.

United Technologies Automotive, Inc.: *See—*
Floyd, William M.; and Juzswik, David L., 4,578,591, Cl. 307-10.00R.

United Technologies Corporation: *See—*
Rosenbush, David M.; Zwicke, Philip E.; and Couch, Robert P., 4,578,756, Cl. 364-431.020.

Universal Data Systems, Inc.: *See—*
Pierce, O. Leon, 4,578,533, Cl. 179-2.0DP.

University of Georgia Research Foundation, Inc.: *See—*
Cormier, Milton J., 4,578,379, Cl. 514-223.000.
Cormier, Milton J., 4,578,385, Cl. 514-223.000.

Uno, Keiichi; Nagano, Hikoichi; and Ikegami, Tadashi, to Toyo Boseki Kabushiki Kaisha. Process of actinic irradiation of shaped polyester imide containing benzophenone tetracarboxylic diimide group and cross-linked product. 4,578,166, Cl. 8-115.520.

UOP Inc.: *See—*
Cetinkaya, Ismail B.; and Myers, Daniel N., 4,578,366, Cl. 502-6.000.
Cleary, Michael T., 4,578,223, Cl. 260-419.000.
Greenwood, Arthur R., 4,578,370, Cl. 502-37.000.
House, David W.; and Scott, Ray V., Jr., 4,578,446, Cl. 528-64.000.

Upjohn Company, The: *See—*
Skulnick, Harvey I.; Smith, Herman W.; Smith, Robert J.; and Wierenga, Wendell, 4,578,466, Cl. 544-309.000.
White, David R., 4,578,485, Cl. 549-361.000.

Urano, Fumio; Okura, Zenichi; and Kawasaki, Masahiro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Photographic camera having a diaphragm actuator with preliminary displacement for lens compensation. 4,577,952, Cl. 354-455.000.

Urban, Manfred; and Schmitt, Dieter, to Merck Patent Gesellschaft mit beschrankter Haftung. Cutting oil for working nonferrous metals by cutting. 4,578,202, Cl. 252-33.400.

Urdal, David L.; March, Carl J.; and Dower, Steven K., to Immunex Corporation. Interleukin 2 receptor. 4,578,335, Cl. 435-68.000.

Urien, Jacques; Bressan, Elie; Danguy, Jacques; and Narzul, Marcel, to Thomson-CSF. Process for the production of an ultra-high frequency cavity resonator and cavity resonator obtained by this process. 4,578,658, Cl. 333-227.000.

Urquhart, John; and Theeuwes, Felix, to ALZA Corporation. Delivery system housing a plurality of delivery devices. 4,578,075, Cl. 604-892.000.

Urso, Charles L. Open face rotatable spool fishing reel. 4,577,807, Cl. 242-84.20C.

Ushio Denki Kabushiki Kaisha: *See—*
Arai, Tetsuji, 4,578,143, Cl. 156-617.00R.
Hiramoto, Tatsumi, 4,578,144, Cl. 156-617.00R.

USV Pharmaceutical Corp.: *See—*
Lee, Thomas D., 4,578,386, Cl. 514-241.000.

Utah State University Foundation: *See—*
Keller, Jack; and Stringham, Glen E., 4,577,802, Cl. 239-11.000.

VALEO: *See—*
Carmillet, Roger F. L., 4,577,740, Cl. 192-70.180.
Guillemin, Jean, 4,577,836, Cl. 251-356.000.

Van Coney, Robert H.: *See—*
Dirksing, William P.; Leman, Marvin G.; and Van Coney, Robert H., 4,578,028, Cl. 425-525.000.

Vanderbilt University: *See—*
Bradley, Charles A.; Benge, Herman; Parl, Fritz F.; and Seebaugh, William R., 4,577,514, Cl. 73-863.010.

van der Lely, Ary; and Bom, Cornelis J. G., to C. Van Der Lely N.V. Mowing machine. 4,577,456, Cl. 56-13.600.

Vanderpool, James L.: *See—*
Hamisch, Paul H., Jr.; Vanderpool, James L.; and Bain, James M., 4,578,138, Cl. 156-361.000.

Vanderpool, Steven H.; and Watts, Lewis W., Jr., to Texaco Inc. Catalytic (calcined catalyst and) preparation of linear polyethylenepolyamines (therewith). 4,578,518, Cl. 564-479.000.

Vanderpool, Steven H.: *See—*
Larken, John M.; and Vanderpool, Steven H., 4,578,519, Cl. 564-479.000.

Van Der Puy, Michael: *See—*
Dimmit, Jeffrey H.; Van Der Puy, Michael; and Soriano, David S., 4,578,250, Cl. 423-22.000.

van der Schyf, Cornelis J.: *See—*
Fourie, Theunis G.; Dekker, Theodor G.; Snyckers, Friedrich O.; and van der Schyf, Cornelis J., 4,578,520, Cl. 568-315.000.

van der Wilk, Ronald: *See—*
van Rijsewijk, Lambertus J. J.; Thomas, Mario L.; Meijer, Henricus J. J. C.; and van der Wilk, Ronald, 4,578,661, Cl. 335-212.000.

van Leerdam, Hans M. L., to Medistad Holland V.V. Infusion liquid pouch. 4,578,074, Cl. 604-408.000.

Van Nguyen, Thanh: *See—*
Lare, Donald W.; and Van Nguyen, Thanh, 4,578,288, Cl. 427-365.000.

vanOmmering, Gerrit: *See—*
Koehler, Charles W.; vanOmmering, Gerrit; and Puester, Neil H., 4,578,324, Cl. 429-26.000.

van Rijckevorsel, Rainer; Kasielke, Joachim; Macho, Heinz; Schafer, Peter; and Nenninger, Klaus, to Boehringer Mannheim GmbH. Method of and apparatus for making a test strip and a test strip made by such method. 4,578,716, Cl. 360-1.000.

van Rijsewijk, Lambertus J. J.; Thomas, Mario L.; Meijer, Henricus J. J. C.; and van der Wilk, Ronald, to U.S. Philips Corporation. Method of manufacturing a cathode ray tube and device for carrying out this method. 4,578,661, Cl. 335-212.000.

Van Uden, Adrianus A.; and Claessen, Johannes A. H., to Heuge Export AG. Process for the production of tufted carpet tiles. 4,578,132, Cl. 156-72.000.

Varghese, Philip: *See—*
Derouane, Eric G.; and Varghese, Philip, 4,578,181, Cl. 208-110.000.

Varian Associates, Inc.: *See—*
James, Bertram G.; Dinapoli, Frank C.; and Hayes, Lloyd P., 4,578,620, Cl. 315-3.500.

Vasta, Joseph A., to Du Pont de Nemours, E. I., and Company. Electrically conductive coating composition of a chlorosulfonated polyethylene. 4,578,286, Cl. 427-327.000.

VEB Kombinat Polygraph "Werner Lamberz" Leipzig: *See—*
Engel, Andreas; Schumann, Frank; Stiefel, Werner; and Freistedt, Reinhold, 4,578,052, Cl. 493-11.000.

VEB Kombinat Textima: *See—*
Bachmann, Bernd; Kuss, Peter; Schuhmann, Frank; and Wollner, Jurgen, 4,577,854, Cl. 271-227.000.

Veba-Glas AG: *See—*
Hubner, Jochen; Knoth, Werner-Dieter; and Hullen, Helmut, 4,578,099, Cl. 65-26.000.

Vegt, Jan W.: *See—*
Posthuma de Boer, Abe; and Vegt, Jan W., 4,578,613, Cl. 310-800.000.

Veillette, Norman T.; and Malik, Robert J., to Nashua Corporation. Carbonless developer sheet. 4,578,690, Cl. 346-212.000.
Verburg, Gerald B.: *See—*
Lambert, Allan H.; Keating, Esmond J.; and Verburg, Gerald B., 4,577,476, Cl. 68-5.00D.
Vereinigte Edestahlwerke Aktiengesellschaft (VEW): *See—*
Cadek, Walter, 4,578,794, Cl. 373-42.000.
Vereyken, Franciscus A. Bicycle. 4,577,879, Cl. 280-256.000.
Verhoeven, Constant T.; Tobback, Hubert J.; and Dompas, John M., to Metallurgie Hoboken-Overpelt. Process and apparatus for separating a suspension bar from an electrode. 4,577,401, Cl. 29-825.000.
Verma, Shiv P.: *See—*
Charalambous, Salomi T.; Horvath, Mark P.; House, Cathy P.; Iapicco, Jeffrey A.; Lue, Paul D.; and Verma, Shiv P., 4,578,796, Cl. 375-8.000.
Verrerie Cristallerie d'Arques J. G. Durand & Cie.: *See—*
Durand, Philippe, 4,577,367, Cl. 16-114.00A.
Versuchs- und Lehranstalt fur Spiritusfabrikation und Fermentationstechnologie in Berlin: *See—*
Bruckner, Harald, 4,578,525, Cl. 568-918.000.
Vetco Offshore, Inc.: *See—*
Milberger, Lionel J.; Lochte, Glen E.; and Masciopinto, Anthony J., 4,577,686, Cl. 166-208.000.
Vicario, Cesare: *See—*
Vicario, Guido F.; Vicario, Cesare; de Luca, Ugo; and Zelioli, Giuseppe, 4,578,169, Cl. 204-299.00R.
Vicario, Guido F.; Vicario, Cesare; de Luca, Ugo; and Zelioli, Giuseppe, to Elvi S.p.A. Apparatus for total and fractional analyses of proteins. 4,578,169, Cl. 204-299.00R.
Vickers PLC: *See—*
Lawson, Leslie E.; and Ingham, Michael, 4,577,948, Cl. 354-299.000.
Vickers Public Limited Company: *See—*
Ray, Colin J.; and Smith, Geoffrey, 4,577,497, Cl. 73-126.000.
Victor Company of Japan, Limited: *See—*
Sasamura, Kouhei, 4,578,647, Cl. 330-253.000.
Takanashi, Itsuo; Nakagaki, Shintaro; Miyazaki, Kenichi; and Kuriyama, Takashi, 4,578,699, Cl. 358-44.000.
Viegener, Walter, to Franz Viegener II, Firma. Air-regulation device for the inlet nozzles of a whirlpool bath. 4,577,353, Cl. 4-544.000.
Viodet, Patrice: *See—*
Bardin, Roland; Bernard, Jean; Peyre, Henri; and Viodet, Patrice, 4,577,887, Cl. 280-628.000.
Viola, Michael S., to Polaroid Corporation. Ink jet printing substrate. 4,578,285, Cl. 427-209.000.
Viramontes-Brown, Ricardo: *See—*
Price-Falcon, Juan F.; and Viramontes-Brown, Ricardo, 4,578,110, Cl. 75-34.000.
Virginia Patent Development Corp.: *See—*
Bogese, Stephen B., II, 4,577,921, Cl. 339-176.00M.
VISA U.S.A., Inc.: *See—*
Zeidler, Howard M., 4,578,530, Cl. 178-22.090.
Vizard, David, to Shelburne Incorporated. Exhaust mufflers for internal combustion engines. 4,577,724, Cl. 181-265.000.
Vnek, John; Prince, Alfred M.; and Ikram, Hafeez, to New York Blood Center, Inc. Synthetic antigenic peptide derived from hepatitis B surface antigen. 4,578,217, Cl. 260-112.50R.
Voest-Alpine Aktiengesellschaft: *See—*
Droscher, Bernhard; and Zitz, Alfred, 4,578,627, Cl. 318-632.000.
Wrulich, Herwig; Schoffmann, Franz; and Maier, Wilfried, 4,577,892, Cl. 285-136.000.
Vogt, Robert E.: *See—*
Oshefsky, Daniel J.; Gavronski, Paul A.; Vogt, Robert E.; and Rajala, Gregory J., 4,578,133, Cl. 156-164.000.
Volker, Werner: *See—*
Kiss, Akos; Kleinschmit, Peter; Volker, Werner; and Halbritter, Gunter, 4,578,212, Cl. 252-301.40F.
Vollert, Emmeran, to Siemens Aktiengesellschaft. Ink printhead. 4,578,686, Cl. 346-140.00R.
Vollmer Werke Maschinenfabrik GmbH: *See—*
Lenard, Peter; Pokorny, Erich; and Bailer, Norbert, 4,577,533, Cl. 76-41.000.
Volz, Robert A., to Scotfoam Corporation. Conductive polyurethane foam and process of contacting a polyurethane foam with a mixture of swelling agent and chemical additive. 4,578,406, Cl. 521-52.000.
von Wedel, Rudiger: *See—*
Frauenfeld, Martin; and von Wedel, Rudiger, 4,577,678, Cl. 165-10.000.
Voss, Josef; and Thevenot, Gilles. Wire basket bird cage which can be assembled from wire grating parts. 4,577,589, Cl. 119-17.000.
W. L. Gore & Assoc., Inc.: *See—*
Inman, Charles M.; and Stone, Donald J., 4,578,063, Cl. 604-175.000.
WABCO Westinghouse Steuerungstechnik GmbH: *See—*
Gottling, Helmut, 4,577,732, Cl. 188-67.000.
Wada, Keisuke; Kobayashi, Yoshimitsu; and Kasori, Yukio, to Mitsubishi Chemical Industries Limited. Process for the production of cinnamic acid esters. 4,578,507, Cl. 560-104.000.
Waddill, Harold G.: *See—*
Sellstrom, Kathy B.; and Waddill, Harold G., 4,578,412, Cl. 524-243.000.
Wade, Peter C.: *See—*
Krapcho, John; and Wade, Peter C., 4,578,474, Cl. 546-188.000.
Wafab, Inc.: *See—*
Kring, Charles J., 4,578,137, Cl. 156-345.000.
Wagner, David L.: *See—*
Armstrong, Thomas E.; Boob, Douglas L.; Burrous, Homer R.; Fryc, Oldrich; and Wagner, David L., 4,577,794, Cl. 227-119.000.
Wagner, John R., Jr.: *See—*
Clauson, Melvil B.; and Wagner, John R., Jr., 4,578,316, Cl. 428-516.000.
Wagner, Peter: *See—*
Heitmann, Jurgen; Loos, Rolf; and Wagner, Peter, 4,578,719, Cl. 360-31.000.
Waiser, Shimon. Fastening means for a removable revolver cylinder. 4,577,429, Cl. 42-59.000.
Wajda, Michael L.: *See—*
Yianilos, Peter N.; and Wajda, Michael L., 4,578,673, Cl. 340-703.000.
Wakabayashi, Senzo, to Nippon Kokan Kabushiki Kaisha; Nippon Rotary Nozzle Co., Ltd.; Kokan Kikai Kogyo Kabushiki Kaisha; and Tokyo Yogyo Kabushiki Kaisha. Hinged rotary nozzle. 4,577,785, Cl. 222-598.000.
Wakasa, Akinori: *See—*
Morita, Tetuya; Wakasa, Akinori; Ogawa, Yutaka; and Ogasawara, Takayuki, 4,577,600, Cl. 123-270.000.
Wake, Harold E. Axial compression hose coupling. 4,577,894, Cl. 285-242.000.
Wako Pure Chemical Industries Ltd.: *See—*
Imai, Kazuhiro; Ogata, Hiroshi; Tanaka, Motoaki; Nawa, Hiroyoshi; and Ishihara, Masami, 4,578,499, Cl. 560-21.000.
Walker, Adrian W., to Lever Brothers Company. Detergent bleach compositions. 4,578,206, Cl. 252-95.000.
Walker, Jerry: *See—*
McIntosh, Robert; Mathews, Harlan P.; Rickert, David W.; Romano, Paul; and Walker, Jerry, 4,578,786, Cl. 369-44.000.
Wallner, Kurt: *See—*
Grosser, Siegfried; Ludwig, Christian; Wallner, Kurt; Herzog, Karl; and Bayerl, Eugen, 4,577,944, Cl. 352-35.000.
Walse, Alan S.: *See—*
Stipanuk, John M.; Walse, Alan S.; and Regnier, Kent E., 4,577,922, Cl. 339-176.0MP.
Walterbos, Johannes W. M.: *See—*
Hoving, Klaas; and Walterbos, Johannes W. M., 4,578,372, Cl. 502-74.000.
Walters, Harry J.: *See—*
Boegner, Gregory J.; Walters, Harry J.; and Marshner, Robert L., 4,577,748, Cl. 198-621.000.
Wang, Chien-Yuan. Joint mechanism for folding ladders, furniture and the like. 4,577,986, Cl. 403-93.000.
Ward, Julie A.: *See—*
Harwood, Alan R.; and Ward, Julie A., 4,577,513, Cl. 73-862.040.
Warner, Donald F., to Heat Exchanger Industries, Inc. Method of manufacturing heat exchangers. 4,577,380, Cl. 29-157.30C.
Warner-Lambert Company: *See—*
Domagala, John M.; and Schroeder, Mel C., 4,578,473, Cl. 546-156.000.
Oksman, Norman H.; Talmage, Joseph M.; and Wells, Henry J., 4,578,358, Cl. 436-66.000.
Oksman, Norman H.; Talmage, Joseph M.; and Wells, Henry J., 4,578,359, Cl. 436-66.000.
Rieger, Martin M., 4,578,405, Cl. 514-679.000.
Satzinger, Gerhard; Barth, Hubert; Hartenstein, Johannes; Herrmann, Manfred; Fritschi, Edgar; and Schutt, Ilse-Dore, 4,578,380, Cl. 514-232.000.
Stampwala, Suresh S.; French, James C.; Tunac, Josefino B.; Hurley, Timothy R.; and Bunge, Richard H., 4,578,383, Cl. 514-7.000.
Warner-Lambert Technologies, Inc.: *See—*
Siegmund, Walter P., 4,578,096, Cl. 65-3.110.
Wartenpfuhl, Friedel: *See—*
Lindorfer, Walter; Jahn-Held, Wilhelm; Gerschler, Lutz J.; Jandel, Berthold; and Wartenpfuhl, Friedel, 4,577,999, Cl. 405-53.000.
Watanabe, Junji, to Tokyo Shibaura Denki Kabushiki Kaisha. Multiple source paper conveyor system. 4,577,849, Cl. 271-9.000.
Watanabe, Shunichi: *See—*
Taneda, Kozo; Chiba, Masae; Naka, Junichi; and Watanabe, Shunichi, 4,578,002, Cl. 406-28.000.
Watanabe, Toshiyuki; Yagihara, Morio; and Adachi, Keiichi, to Fuji Photo Film Co., Ltd. Silver halide color photographic light-sensitive materials. 4,578,346, Cl. 430-548.000.
Waterman, Paul S.: *See—*
Singh, Balwant; and Waterman, Paul S., 4,578,513, Cl. 564-56.000.
Waters, Mark H., to AMP Incorporated. Boot and shielded cable connector. 4,577,919, Cl. 339-59.00M.
Watkins, Joseph J.: *See—*
Jackson, Winston J., Jr.; and Watkins, Joseph J., 4,578,453, Cl. 528-302.000.
Watson Industries, Inc.: *See—*
Watson, William S., 4,578,650, Cl. 331-160.000.
Watson, William G., to Olin Corporation. Method and apparatus for casting ingot with refined grain structure. 4,577,676, Cl. 164-468.000.
Watson, William S., to Watson Industries, Inc. Resonance drive oscillator circuit. 4,578,650, Cl. 331-160.000.
Watts, Glen A. Variable width two-way gang plow. 4,577,698, Cl. 172-225.000.
Watts, Lewis W., Jr.: *See—*
Vanderpool, Steven H.; and Watts, Lewis W., Jr., 4,578,518, Cl. 564-479.000.
Wavin B.V.: *See—*
Holsappel, Albert, 4,578,329, Cl. 430-18.000.

Waxman, Menashe B.: *See—*
Berkovits, Barouh V.; Waxman, Menashe B.; and Combs, William J., 4,577,633, Cl. 128-419.0PG.
Wean United, Inc.: *See—*
Greenberger, Joseph I., 4,577,482, Cl. 72-201.000.
Weaver, Gregory A.; Price, Lester F.; Britt, Crawford R.; and Shalaby, W. Shalaby, to Ethicon, Inc. Surgical filaments from block copolyetheramides. 4,578,451, Cl. 528-292.000.
Webb, Jimmy L., to General Electric Company. Bis-imides containing heterocyclic aromatic rings. 4,578,470, Cl. 546-256.000.
Weber, Frank D.: *See—*
Silke, Gerald W.; and Weber, Frank D., 4,577,499, Cl. 73-432.00R.
Webster Spring Co. Inc.: *See—*
Hagemeister, Robert C., 4,577,841, Cl. 267-103.000.
Weghaupt, Erich; Intichar, Lutz; and Schnapper, Christoph, to Kraftwerk Union Aktiengesellschaft. Device for coupling two shafts of a rotating machine for heat transfer and sealing. 4,577,871, Cl. 277-8.000.
Weglage, David E., to McIntire, Harold K., a part interest. Snap ring tool. 4,577,382, Cl. 29-229.000.
Wehner, Wolfgang; and Grade, Reinhardt, to Ciba-Geigy Corporation. Ammonium stannates-(IV). 4,578,489, Cl. 556-100.000.
Wehr Corporation: *See—*
Klimczak, William J., 4,578,092, Cl. 55-302.000.
Wehrmacher, William H.: *See—*
Flies, William P.; and Wehrmacher, William H., 4,578,573, Cl. 235-492.000.
Weichenrieder, Erich, to Recycloplast AG. Anti-friction bearing unit of a synthetic resin processing machine. 4,577,980, Cl. 384-488.000.
Weidemann, Jorn U., to L. P. Weidemann & Sonner. Apparatus for attachment to a baler. 4,577,553, Cl. 100-4.000.
Weier, Richard M.: *See—*
Collins, Paul W.; and Weier, Richard M., 4,578,505, Cl. 560-118.000.
Weinert, Friedrich. Multiple power wheel engine. 4,577,464, Cl. 60-531.000.
Wells, Carol L. Wheelchair attached storage bag. 4,577,903, Cl. 297-188.000.
Wells, Henry J.: *See—*
Oksman, Norman H.; Talmage, Joseph M.; and Wells, Henry J., 4,578,358, Cl. 436-66.000.
Oksman, Norman H.; Talmage, Joseph M.; and Wells, Henry J., 4,578,359, Cl. 436-66.000.
Welterlin, Raymond E., to Buehler Products, Inc. Brushless DC electric motor and tachogenerator assembly. 4,578,606, Cl. 310-68.00R.
Welz, Fritz: *See—*
Heitmann, Heinrich; Tolksdorf, Wolfgang; Welz, Fritz; and Witter, Klaus, 4,578,651, Cl. 332-7.510.
Werner, Peter: *See—*
Arnold, Herbert; Horbelt, Michael; Seibel, Berthold; Strobele, Hans-Peter; and Werner, Peter, 4,577,605, Cl. 123-479.000.
Werntgen, Ewald: *See—*
Jestrich, Hans-Achim; and Werntgen, Ewald, 4,577,507, Cl. 73-640.000.
Werrbach, Donn R. Dynamic verification gate circuit. 4,578,648, Cl. 330-281.000.
Wesseldine, Dianne M. Incontinence and protective device for animals. 4,577,591, Cl. 119-143.000.
West Electric Co., Ltd.: *See—*
Iwata, Hiroshi; and Makino, Hiroshi, 4,578,783, Cl. 367-99.000.
West, Jeffery A.; and Fletcher, Thomas D., to Signetics Corporation. Voltage signal translator. 4,578,602, Cl. 307-475.000.
West, Leslie L., to Plessey Overseas Limited. Electro-acoustic transducers. 4,578,808, Cl. 381-88.000.
West, Paul R.: *See—*
Griffing, Bruce F.; and West, Paul R., 4,578,344, Cl. 430-312.000.
Westerfeld, Eric C.: *See—*
Desai, Anil I.; and Westerfeld, Eric C., 4,578,773, Cl. 364-900.000.
Westermann, Wolfgang. Synthetic resin film wound capacitor. 4,578,737, Cl. 361-308.000.
Western Geophysical Company of America: *See—*
Gelfand, Valery A., 4,578,785, Cl. 367-35.000.
Savit, Carl H., 4,577,723, Cl. 181-120.000.
Westinghouse Electric Corp.: *See—*
Cadwell, Dennis J., 4,578,240, Cl. 376-441.000.
Degenford, James E.; and Boire, Daniel C., 4,578,629, Cl. 323-217.000.
Gyugyi, Laszlo; Heinrich, Theodore M.; and Cho, Gyu-Hyeong, 4,578,746, Cl. 363-161.000.
Harrison, Earnest R., Jr., 4,578,676, Cl. 343-17.10R.
Healey, Daniel J., III; and Hahn, Hyo K., 4,578,634, Cl. 324-56.000.
Hornak, Leonard P., 4,577,361, Cl. 15-21.00R.
Junker, Warren R.; Taszarek, Bruce J.; and Chizmar, David A., 4,578,643, Cl. 324-202.000.
Karol, Herman S., 4,577,729, Cl. 187-95.000.
Kemeny, George A., 4,577,545, Cl. 89-8.000.
Miller, Robert C., 4,578,639, Cl. 324-96.000.
Peterson, Steven H.; and Jackovitz, John F., 4,578,165, Cl. 204-157.750.
Sahasrabudhe, Arum P.; Dadpey, Habib; Cirillo, Fernando A.; Merlo, Antonia C.; and Zuber, Pierre A. M., 4,578,754, Cl. 364-426.000.
Shuck, David L.; and Knudsen, Irving E., 4,577,972, Cl. 366-101.000.
Westphal, Dietmar B.: *See—*
Jackman, Dennis E.; and Westphal, Dietmar B., 4,578,463, Cl. 544-182.000.
Westphal, Paul: *See—*
Buhl, Reihard; and Westphal, Paul, 4,577,987, Cl. 403-133.000.
Wetzel, Donald C. Air line pressure tester. 4,577,511, Cl. 73-756.000.
Weyerhaeuser Company: *See—*
Lancaster, Eugene P., 4,578,072, Cl. 604-385.00A.
Wheat, Thomas E.: *See—*
Goldberg, Erwin; and Wheat, Thomas E., 4,578,219, Cl. 260-112.50R.
Wheeler, Gary. Sailboat mast ladder. 4,577,726, Cl. 182-93.000.
Wheeler, Jay A.; and Willmore, James A., to Opto Systems, Inc. Bar code reader with diode feedback in amplifier. 4,578,576, Cl. 250-214.00A.
White, David R., to Upjohn Company, The. The Synthesis of spectinomycin analogs by an improved Grignard process. 4,578,485, Cl. 549-361.000.
White, James M.; May, Ronald W.; and Gulliver, Michael D., to International Business Machines (IBM). Video data signal digitization and correction system. 4,578,711, Cl. 358-282.000.
White, Lester L.: *See—*
Borg, Kevin E.; Halas, William P.; Mattes, Hans G.; McLear, Paul M.; and White, Lester L., 4,578,540, Cl. 179-2.00A.
Whitehead, Derek J., to Castex Products Limited. Pharmaceutical pellet. 4,578,263, Cl. 424-15.000.
Whitehead, Howard A.; and Braun, Ralph V., to Kimberly-Clark Corporation. Breathable baffle composite. 4,578,069, Cl. 604-370.000.
Wickmann-Werke Boblingen GmbH: *See—*
Efinger, Arnold, 4,578,550, Cl. 200-144.00B.
Widen, Bo, to GKN-Stenman AB. Cylinder lock arrangement for preventing picking. 4,577,479, Cl. 70-364.00A.
Wiechert, Rudolf: *See—*
Furst, Andor; Muller, Marcel; Kerb, Ulrich; and Wiechert, Rudolf, 4,578,475, Cl. 548-126.000.
Wierenga, Wendell: *See—*
Skulnick, Harvey I.; Smith, Herman W.; Smith, Robert J.; and Wierenga, Wendell, 4,578,466, Cl. 544-309.000.
Wiese, Heiner; and Gramss, Rainer, to ITW Ateco GmbH. Guiding sleeve for head rests at vehicle seats. 4,577,904, Cl. 297-410.000.
Wilke, Arthur: *See—*
Schlegel, Wolfgang; Wilke, Arthur; and Stein, Roland, 4,577,844, Cl. 269-71.000.
Wilkerson, David T., to Masters Wilkerson Manufacturing Co. Ltd. Backing for a photo or picture frame. 4,577,822, Cl. 248-463.000.
Wilkes, John G.: *See—*
Bartlett, Brian E.; Harris, James E.; and Wilkes, John G., 4,578,145, Cl. 156-616.00R.
Williams, Allton C. Artificial leg. 4,578,083, Cl. 623-42.000.
Williams, Clyde C.: *See—*
Kalnin, Ilmar L.; Goldberg, Harris A.; and Williams, Clyde C., 4,577,979, Cl. 374-178.000.
Williams, James R.: *See—*
Bingaman, Barrett P.; Krum, Richard G.; and Williams, James R., 4,577,790, Cl. 226-118.000.
Williams, John W., to Boeing Company, The. Hydrofoil seal. 4,577,579, Cl. 114-274.000.
Williams, Richard E., to Numa Corporation. Portable bar code scanning device and method. 4,578,571, Cl. 235-472.000.
Williams, Richard J., to Rockwell International Corporation. Brake drum. 4,577,734, Cl. 188-218.00R.
Williamson, Calvin C.: *See—*
Powers, Joseph E.; and Williamson, Calvin C., 4,577,796, Cl. 228-102.000.
Willmore, James A.: *See—*
Wheeler, Jay A.; and Willmore, James A., 4,578,576, Cl. 250-214.00A.
Wilson, Bruce C., to American Hospital Supply Corporation. Construction of a monolithic reinforced catheter with flexible portions. 4,577,543, Cl. 87-11.000.
Wilson, John F.: *See—*
Marshall, Peter E. G.; Piper, Francis R.; and Wilson, John F., 4,577,489, Cl. 73-40.700.
Wilson, Joseph H.; Rapp, Jeffrey C.; Southern, Brian K.; and Elliott, Martin E., to Medical Safetec, Inc. Waste disposal system. 4,578,185, Cl. 210-85.000.
Windish, Willis E.: *See—*
Richards, David L.; and Windish, Willis E., 4,577,524, Cl. 74-411.500.
Winegeart, Mitchel E. High pressure ball valve with an interference fit closure seal. 4,577,830, Cl. 251-84.000.
Winter, Joseph; and Pryor, Michael J., to Olin Corporation. Optical fiber communication cables and method and apparatus for assembling same. 4,577,925, Cl. 350-96.230.
Wintershall AG: *See—*
Lindorfer, Walter; Jahn-Held, Wilhelm; Gerschler, Lutz J.; Jandel, Berthold; and Wartenpfuhl, Friedel, 4,577,999, Cl. 405-53.000.
Wirsching, Wayne S. Method and apparatus for generating energy. 4,577,460, Cl. 60-39.350.
Witter, Klaus: *See—*
Heitmann, Heinrich; Tolksdorf, Wolfgang; Welz, Fritz; and Witter, Klaus, 4,578,651, Cl. 332-7.510.
Wohrle, Rudolf: *See—*
Kober, Kurt; Wohrle, Rudolf; and Kohler, Robert, 4,577,882, Cl. 280-446.00R.

Wolf, Rainer: *See—*
Gembus, Hans-Dieter; and Wolf, Rainer, 4,577,659, Cl. 137-614.060.
Wollner, Jurgen: *See—*
Bachmann, Bernd; Kuss, Peter; Schuhmann, Frank; and Wollner, Jurgen, 4,577,854, Cl. 271-227.000.
Wong, Jacob Y., to Tri-Med Inc. Self-calibrating carbon dioxide analyzer. 4,578,762, Cl. 364-497.000.
Woo Kyong Industrial Co., Ltd.: *See—*
Kim, Myong H., 4,577,778, Cl. 220-404.000.
Wood, Edward T., to Completion Tool Company. Sequential inflatable packer. 4,577,695, Cl. 166-387.000.
Wood, Eric, to Insituform Intl Inc. Method of cutting apertures in lining in underground pipes. 4,577,388, Cl. 29-558.000.
Woodard, Lillie M.: *See—*
Birch, William A.; and Woodard, Lillie M., 4,578,599, Cl. 307-272.00A.
Woods, Allan O., to Hydril Company. Remote switch position indicator. 4,578,669, Cl. 340-518.000.
Wooster, George S.: *See—*
Kirtley, Stephen W.; and Wooster, George S., 4,578,283, Cl. 427-85.000.
Worbois, Robert J., to American Standard Inc. Quick release valve arrangement. 4,577,910, Cl. 303-69.000.
Word, Nancy S.: *See—*
Katkocin, Dennis M.; Word, Nancy S.; and Yang, Shiow-Shong, 4,578,352, Cl. 435-99.000.
Worth, Ernest H. Laminated material. 4,578,309, Cl. 428-315.500.
Wright, David M., to Sunbeam Plastics Corporation. Tamper indicating screw cap. 4,577,770, Cl. 215-252.000.
Wright, Hal E.: *See—*
Regan, Michael T.; and Wright, Hal E., 4,578,330, Cl. 430-37.000.
Wright, Paul R.; and Hill, Dale A., to Douglas & Lomason Company. Valve bag placing machine and method. 4,577,454, Cl. 53-492.000.
Wright, Richard F.: *See—*
Saccocio, Edward J.; Kiser, T. Kay; Wright, Richard F.; and Head, Donald L., 4,578,340, Cl. 430-138.000.
Wrulich, Herwig; Schoffmann, Franz; and Maier, Wilfried, to Voest-Alpine Aktiengesellschaft. Arrangement for supplying a pressurized liquid to a rotating machine part. 4,577,892, Cl. 285-136.000.
Wu, Frederick Y., to Perkin-Elmer Corporation, The. Continuous alignment target pattern and signal processing. 4,578,590, Cl. 250-548.000.
Wurgler, Rolf: *See—*
Frischknecht, Bruno; and Wurgler, Rolf, 4,577,672, Cl. 164-428.000.
Wyatt, Ray E.: *See—*
Mundt, Randall S.; and Wyatt, Ray E., 4,578,128, Cl. 148-191.000.
Wyse, Harold G. Scraper ring for cleaning a hydraulic cylinder rod or shaft. 4,577,363, Cl. 15-256.500.
Wyser, Johann, to Stork Brabant B.V. Device for taking a sample from a continuously advancing web. 4,577,516, Cl. 73-864.410.
Xerox Corporation: *See—*
Genovese, Frank C.; and Lannom, James W., 4,578,615, Cl. 313-497.000.
Gruber, Robert J.; Koch, Ronald J.; and Knapp, John F., 4,578,338, Cl. 430-120.000.
Yip, Kwok-leung; and Daniele, Joseph J., 4,577,933, Cl. 350-358.000.
Zambelli, Robert G., 4,577,960, Cl. 355-75.000.
Yachigo, Shinichi: *See—*
Takahashi, Yukoh; Fujii, Takeo; Shionoya, Masahisa; Yachigo, Shinichi; and Ishii, Tamaki, 4,578,410, Cl. 524-102.000.
Yoshimura, Masakatsu; Fujii, Takeo; Yachigo, Shinichi; and Ishii, Tamaki, 4,578,472, Cl. 546-188.000.
Yager, John W., administrator: *See—*
Go, Santos W., deceased; and Jabarin, Saleh A., 4,577,768, Cl. 215-1.00C.
Yagi, Junsuke: *See—*
Ashina, Yoshiro; Fujita, Takeyuki; Fukatsu, Michio; and Yagi, Junsuke, 4,578,516, Cl. 564-479.000.
Yagihara, Morio: *See—*
Ohno, Shigeru; Kishimoto, Shinzo; Ikegawa, Akihiko; and Yagihara, Morio, 4,578,345, Cl. 430-393.000.
Watanabe, Toshiyuki; Yagihara, Morio; and Adachi, Keiichi, 4,578,346, Cl. 430-548.000.
Yagishita, Kikuji: *See—*
Oota, Makoto; Nekozuka, Masamichi; and Yagishita, Kikuji, 4,578,672, Cl. 340-702.000.
Yamada, Tetsusyo; and Hirate, Shintaro, to NGK Spark Plug Co., Ltd.; and Mitsubishi Denki Kabushiki Kaisha. Air/fuel ratio detector. 4,578,171, Cl. 204-406.000.
Yamada, Tetsusyo; and Hirate, Shintaro, to NGK Spark Plug Co.; and Mitsubishi Denki K.K. Air/fuel ratio detector. 4,578,172, Cl. 204-412.000.
Yamaguchi, Hisao; Kanno, Hideo; Okamiya, Yoshiaki; and Sunakawa, Kiyotaka, to Teijin Limited. Certain aralkylaminoalkyl esters of 1,4 dihydropyridines as antihypertensive. 4,578,395, Cl. 514-356.000.
Yamaguchi, Kazuo: *See—*
Ohnishi, Haruo; Yamaguchi, Kazuo; Suzuki, Yasuo; and Mochida, Nobuo, 4,578,400, Cl. 514-460.000.
Yamaguchi, Shingo, to Ricoh Company, Ltd. Picture signal quantizing circuit. 4,578,715, Cl. 358-283.000.
Yamaha Hatsudoki Kabushiki Kaisha: *See—*
Foote, Douglas C.; and Grinde, James E., 4,577,712, Cl. 180-53.400.
Nomura, Kazuhiko; Kazuta, Hisashi; and Kimura, Hiroshi, 4,577,719, Cl. 180-219.000.
Yamakawa, Kazuo; and Dohi, Toshihide, to Minolta Camera Kabushika Kaisha. Video projector lens system. 4,577,935, Cl. 350-432.000.
Yamamiya, Hideki: *See—*
Sahashi, Masashi; Inomata, Koichiro; Sori, Naoyuki; and Yamamiya, Hideki, 4,578,125, Cl. 148-31.570.
Yamamoto, Naoki; and Sakudo, Noriyuki, to Hitachi, Ltd. Method of forming electrical contact to a semiconductor substrate via a metallic silicide or silicon alloy layer formed in the substrate. 4,577,396, Cl. 29-576.00B.
Yamamoto, Soichi. Rice-hulling apparatus. 4,577,552, Cl. 99-524.000.
Yamamoto, Sumio: *See—*
Kosemura, Kinjiro; Yamashita, Yoshimi; Nakayama, Noriaki; and Yamamoto, Sumio, 4,578,343, Cl. 430-296.000.
Yamamoto, Takemi; Kuzuya, Susumu; Kagami, Isao; and Takenaka, Yuuichi, to Brother Kogyo Kabushiki Kaisha. Paper feeding device for a printing apparatus providing alternatively different feed paths. 4,577,984, Cl. 400-625.000.
Yamamoto, Yozo: *See—*
Sugisawa, Ko; Shibuki, Masaru; Imada, Imayoshi; Katada, Jun; Yamamoto, Yozo; Nakajima, Setsuo; Kishi, Toshio; and Sugano, Shozo, 4,578,274, Cl. 426-96.000.
Yamana, Kozi, to Casio Computer Co., Ltd. Electronic musical instrument having a pan-pot function. 4,577,540, Cl. 84-1.270.
Yamanouchi Pharmaceutical Co., Ltd.: *See—*
Kawata, Hiroitsu; Ohmura, Tadayoshi; Hasumi, Shunji; Konno, Yutaka; Aruga, Masayoshi; Tashiro, Seiki; Konno, Toshimitsu; and Iwai, Ken, 4,578,391, Cl. 514-256.000.
Yamashita, Hidekazu; and Kominami, Hideyuki, to Matsushita Electric Industrial Company, Limited. Multi-unit induction heat cooking apparatus having a common noise rejection filter. 4,578,553, Cl. 219-10.770.
Yamashita, Hisao: *See—*
Mori, Toshikatsu; Takeuchi, Seizi; Matsuda, Shimpei; Kumagi, Teruo; Kato, Akira; Yamashita, Hisao; and Takeuchi, Masato, 4,578,112, Cl. 75-108.000.
Yamashita, Yoshimi: *See—*
Kosemura, Kinjiro; Yamashita, Yoshimi; Nakayama, Noriaki; and Yamamoto, Sumio, 4,578,343, Cl. 430-296.000.
Yampolsky, Jack S.; and Carosella, David P. E., Jr., to GA Technologies Inc. Heat exchanger. 4,577,682, Cl. 165-160.000.
Yanagisawa, Akira: *See—*
Noyori, Ryoji; Suzuki, Masaaki; Yanagisawa, Akira; and Kurozumi, Seizi, 4,578,482, Cl. 549-214.000.
Yanagiuchi, Yukihiro: *See—*
Sakakima, Hiroshi; Satomi, Mitsuo; Yanagiuchi, Yukihiro; and Senno, Harufumi, 4,578,728, Cl. 360-125.000.
Yang, Kei-Hsiung, to International Business Machines Corporation. Weak boundary storage liquid crystal display devices with bias voltage. 4,577,930, Cl. 350-332.000.
Yang, Shiow-Shong: *See—*
Katkocin, Dennis M.; Word, Nancy S.; and Yang, Shiow-Shong, 4,578,352, Cl. 435-99.000.
Yang, Tai-Her. Remote controlled surveillance train car. 4,578,665, Cl. 340-48.000.
Yasuda, Keiichi: *See—*
Aoyagi, Masao; Kobayashi, Kazufumi; and Yasuda, Keiichi, 4,577,934, Cl. 350-430.000.
Yasuda, Yutaka; Hirata, Yasuo; Murakami, Shuji; Nakamura, Katsuhiro; and Furuya, Yukitsuna. Synchronization circuit for a Viterbi decoder. 4,578,800, Cl. 375-106.000.
Yater, Jerry L., to Force Control Industries, Inc. Drive system with oil shear clutch-brake unit. 4,577,738, Cl. 192-18.00A.
Yazaki, Yoshio, to ORC Manufacturing Co., Ltd. Exposure apparatus. 4,577,959, Cl. 355-67.000.
Yazawa, Yoshiaki; Miyakawa, Nobuaki; Mukai, Toji; Ikeda, Takahide; and Kamei, Tatsuya, to Hitachi, Ltd. Semiconductive photodetector device. 4,578,693, Cl. 357-30.000.
Yazolino, Lauren F.: *See—*
Faggin, Federico; Klein, Jerry A.; Yazolino, Lauren F.; Korody, Robert; Ha, Eric P. L.; and Kerman, Stephan, 4,578,537, Cl. 179-2.0DP.
Yeakey, Ernest L.; Speranza, George P.; Triebel, Carol A.; and McCoy, David R., to Texaco, Inc. Use of methylene azelaic acid as a corrosion inhibitor. 4,578,205, Cl. 252-76.000.
Yeaney, Gerald L.: *See—*
Silka, John L.; and Yeaney, Gerald L., 4,577,764, Cl. 211-41.000.
Yianilos, Peter N.; and Wajda, Michael L., to Franklin Computer Corporation. Video color generator circuit for computer. 4,578,673, Cl. 340-703.000.
Yip, Kwok-leung; and Daniele, Joseph J., to Xerox Corporation. Gap modulator for high speed scanners. 4,577,933, Cl. 350-358.000.
Yoichi, Sakamoto, to Matsushita Electric Industrial Co., Ltd. Television synchronous receiver. 4,578,706, Cl. 358-195.100.
Yonge, Lawrence W., III: *See—*
Hooper, Robert L.; and Yonge, Lawrence W., III, 4,578,682, Cl. 343-916.000.
Yoshida, Eiji: *See—*
Kudo, Yoshihiko; and Yoshida, Eiji, 4,578,257, Cl. 423-243.000.
Yoshida, Katsushige: *See—*
Omae, Yoshihiro; Ishikawa, Kunio; Fukao, Takahisa; and Yoshida, Katsushige, 4,577,385, Cl. 29-402.180.
Yoshida, Mitsunari: *See—*
Teshima, Toru; Aizawa, Masanobu; Yoshida, Mitsunari; Shima, Toshiyuki; and Takeda, Masakazu, 4,578,043, Cl. 445-40.000.

Yoshihara, Satoshi: *See*—
Sawamura, Mitsuharu; Ito, Susumu; Matsushima, Masaaki; Kishi, Hiroyoshi; Sasamori, Eizo; Yoshihara, Satoshi; Iijima, Shigeharu; and Takano, Katsuhiko, 4,578,322, Cl. 428-694.000.

Yoshimoto, Teturo: *See*—
Oguro, Tadayuki; Yoshimoto, Teturo; and Niki, Hazime, 4,577,733, Cl. 188-217.000.

Yoshimura, Masakatsu; Fujii, Takeo; Yachigo, Shinichi; and Ishii, Tamaki, to Sumitomo Chemical Company, Limited. 2,2,6,6-Tetramethylpiperidine and its production. 4,578,472, Cl. 546-188.000.

Yoshioka, Yoshio: *See*—
Tokuyama, Shunji; Suzuki, Kooji; Hirasawa, Kunio; Yoshioka, Yoshio; and Arimatsu, Keiji, 4,578,730, Cl. 361-4.000.

Yoshitomi Pharmaceutical Industries, Ltd.: *See*—
Tahara, Tetsuya; and Arita, Masafumi, 4,578,397, Cl. 514-411.000.

Yoshizuka Seiki Co., Ltd.: *See*—
Kimura, Quanbee, 4,577,981, Cl. 384-495.000.

Youden, Richard W.: *See*—
Allen, Richard J.; and Youden, Richard W., 4,578,637, Cl. 324-73.0PC.

Youmans, Barry J.: *See*—
Ciammaichella, Richard C.; and Youmans, Barry J., 4,578,583, Cl. 250-339.000.

Young, Gerald A.: *See*—
Kramer, Timothy A.; Young, Gerald A.; and Kock, Ronald W., 4,578,068, Cl. 604-368.000.

Yuchi, Kazuhide, to Mitsubishi Denki Kabushiki Kaisha. Air conditioning device for a vehicle. 4,577,800, Cl. 237-2.00A.

Yudate, Kozo; and Nagasawa, Ken, to Kawasaki Steel Corporation. Method for producing a precursor pitch for carbon fiber. 4,578,177, Cl. 208-45.000.

Yuen, John S., to John Manufacturing Limited. Rechargeable vacuum cleaner. 4,577,365, Cl. 15-339.000.

Yui, Yoshio, to NEC Corporation. Digital image processing by hardware using cubic convolution interpolation. 4,578,812, Cl. 382-41.000.

Yusa, Hideo: *See*—
Gotou, Tadashi; Kawamura, Fumio; Sagawa, Norihiko; and Yusa, Hideo, 4,578,325, Cl. 429-91.000.
Ouchi, Isao; and Yusa, Hideo, 4,578,294, Cl. 428-35.000.

Yutori, Toshiaki; Sudo, Masatoshi; Kato, Takehiko; and Hosogi, Yasuhiro, to Kabushiki Kaisha Kobe Seiko Sho. High strength low carbon steels, steel articles thereof and method for manufacturing the steels. 4,578,124, Cl. 148-12.00F.

Zahavi, Joseph: *See*—
Halliwell, Michael J.; and Zahavi, Joseph, 4,578,155, Cl. 204-15.000.
Halliwell, Michael J.; and Zahavi, Joseph, 4,578,157, Cl. 204-15.000.

Zambelli, Robert G., to Xerox Corporation. Document registration apparatus. 4,577,960, Cl. 355-75.000.

Zanner, Frank J.: *See*—
Fisher, Robert W.; Maroone, James P.; Tipping, Donald W.; and Zanner, Frank J., 4,578,795, Cl. 373-70.000.

Zapka, Werner: *See*—
Behringer, Uwe; Bohlen, Harald; Nehmiz, Peter; and Zapka, Werner, 4,578,587, Cl. 250-492.200.

Zeidler, Howard M., to VISA U.S.A., Inc. End-to-end encryption system and method of operation. 4,578,530, Cl. 178-22.090.

Zelioli, Giuseppe: *See*—
Vicario, Guido F.; Vicario, Cesare; de Luca, Ugo; and Zelioli, Giuseppe, 4,578,169, Cl. 204-299.00R.

Zell, John T., to Zell, John T.; and Franchino, Michael R. Arrow holder. 4,577,612, Cl. 124-41.00A.

Zembayashi, Michio: *See*—
Pratt, Sandra L.; Lucas, Gary M.; and Zembayashi, Michio, 4,578,492, Cl. 556-407.000.

Zibold, Karl: *See*—
Bohringer, Wilfried; Eheim, Franz, deceased; Fehlmann, Wolfgang; Laufer, Helmut; and Zibold, Karl, 4,577,606, Cl. 123-506.000.

Ziegenhorn, Joachim: *See*—
Siedel, Joachim; Neumann, Ulrich; Ziegenhorn, Joachim; Batz, Hans-Georg; Lenz, Helmut; Pautz, Brigitte; and Albert, Winfried, 4,578,361, Cl. 436-547.000.

Ziehn, Klaus-Dieter, to H.F. & Ph.F Reemtsma GmbH & Co. Process for improving the fillability of tobacco. 4,577,646, Cl. 131-296.000.

Zingher, Arthur R., to International Business Machines Corporation. Inspection of multilayer ceramic circuit modules by electrical inspection of unfired green sheets. 4,578,279, Cl. 427-10.000.

Zinkiewicz, Lawrence M.: *See*—
Rezek, Edward A.; and Zinkiewicz, Lawrence M., 4,578,126, Cl. 148-171.000.

Zitting, Gordon T., to Microdot incorporated. Seal assembly. 4,577,874, Cl. 277-165.000.

Zitz, Alfred: *See*—
Droscher, Bernhard; and Zitz, Alfred, 4,578,627, Cl. 318-632.000.

Zochbauer, Michael, to Hartmann & Braun AG. Low-pressure, hollow cathode lamp. 4,578,618, Cl. 313-563.000.

Zoeller, Joseph R., to Eastman Kodak Company. Catalyst recovery process. 4,578,368, Cl. 502-28.000.

Zoltan, Leszlauer. Anode structure for electrolytic fibre capacitors and method for manufacturing the same. 4,578,738, Cl. 361-324.000.

Zsidai, Jozsef: *See*—
Csizer, Zoltan; Sikos, Karoly; Bacskai, Laszlo; Joo, Istvan; Niedermayer, Eleonora; Rethy, Lajos; and Zsidai, Jozsef, 4,578,270, Cl. 424-92.000.

Zuber, Pierre A. M.: *See*—
Sahasrabudhe, Arum P.; Dadpey, Habib; Cirillo, Fernando A.; Merlo, Antonia C.; and Zuber, Pierre A. M., 4,578,754, Cl. 364-426.000.

Zwicke, Philip E.: *See*—
Rosenbush, David M.; Zwicke, Philip E.; and Couch, Robert P., 4,578,756, Cl. 364-431.020.

Zymark Corporation: *See*—
Hutchins, Burleigh M.; Buote, William J.; and Finn, Lawrence J., 4,578,764, Cl. 364-513.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 25TH DAY OF MARCH, 1986

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Atanasoff, John V.; Clark, W. Kenneth; Henderson, David; and Wreghitt, Kenneth W., to Avco Corporation. Overflying munitions device and system. Re. 32,094, Cl. 102-384.000.

Avco Corporation: *See*—
Atanasoff, John V.; Clark, W. Kenneth; Henderson, David; and Wreghitt, Kenneth W., Re. 32,094, Cl. 102-384.000.

Chopra, Inder J., to Research and Education Institute, Inc. Radioimmunoassay for measurement of thyroxine (T_4) and triiodothyronine (T_3) in blood serum. Re. 32,098, Cl. 424-1.000.

Clark, W. Kenneth: *See*—
Atanasoff, John V.; Clark, W. Kenneth; Henderson, David; and Wreghitt, Kenneth W., Re. 32,094, Cl. 102-384.000.

Eastman Kodak Company: *See*—
Silverman, Robert A.; and Hoyen, Harry A., Re. 32,097, Cl. 430-217.000.

Graf, Gerhard: *See*—
Hill, Bernhard; Schmidt, Klaus; and Graf, Gerhard, Re. 32,099, Cl. 346-108.000.

Henderson, David: *See*—
Atanasoff, John V.; Clark, W. Kenneth; Henderson, David; and Wreghitt, Kenneth W., Re. 32,094, Cl. 102-384.000.

Hill, Bernhard; Schmidt, Klaus; and Graf, Gerhard, to U.S. Philips Corporation. Optical printer. Re. 32,099, Cl. 346-108.000.

Hoyen, Harry A.: *See*—
Silverman, Robert A.; and Hoyen, Harry A., Re. 32,097, Cl. 430-217.000.

Jeffries, Ernest H., Jr., to Resco Products, Inc. End block. Re. 32,096, Cl. 52-396.000.

Philip Morris Incorporated: *See*—
Wu, D. Louise; and Swain, James W., Re. 32,095, Cl. 131-275.000.

Resco Products, Inc.: *See*—
Jeffries, Ernest H., Jr., Re. 32,096, Cl. 52-396.000.

Research and Education Institute, Inc.: *See*—
Chopra, Inder J., Re. 32,098, Cl. 424-1.000.

Schmidt, Klaus: *See*—
Hill, Bernhard; Schmidt, Klaus; and Graf, Gerhard, Re. 32,099, Cl. 346-108.000.

Silverman, Robert A.; and Hoyen, Harry A., to Eastman Kodak Company. Blended grain direct-positive emulsions and photographic elements and processes for their use. Re. 32,097, Cl. 430-217.000.

Swain, James W.: *See*—
Wu, D. Louise; and Swain, James W., Re. 32,095, Cl. 131-275.000.

U.S. Philips Corporation: *See*—
Hill, Bernhard; Schmidt, Klaus; and Graf, Gerhard, Re. 32,099, Cl. 346-108.000.

Wreghitt, Kenneth W.: *See*—
Atanasoff, John V.; Clark, W. Kenneth; Henderson, David; and Wreghitt, Kenneth W., Re. 32,094, Cl. 102-384.000.

Wu, D. Louise; and Swain, James W., to Philip Morris Incorporated. Cooked flavors for smoking products. Re. 32,095, Cl. 131-275.000.

LIST OF DESIGN PATENTEES

Abe, Karl H.; and Gevert, Klaus V., to Bayerische Motoren Werke AG. Lower fairing for motorcycles. 283,119, 3-25-86, Cl. D12-182.000.

Ace Orthopedic Company Inc.: *See*—
Stednitz, Denis P., 283,083, Cl. D3-74.000.

American Home Products Corporation (Del.): *See*—
Godsey, James H., 283,159, Cl. D24-31.000.
Godsey, James H., 283,161, Cl. D24-31.000.
Godsey, James H., 283,162, Cl. D24-31.000.

Armatron International, Inc.: *See*—
Cunning, Joseph M., 283,152, Cl. D22-19.000.
DeYoreo, Sal, 283,153, Cl. D22-19.000.

Baker, Daniel A., to Percom Data Corporation. Microfloppy disk drive. 283,131, 3-25-86, Cl. D14-109.000.

Bannigan, Francis R. Combined drawer unit and electric powerboard. 283,084, 3-25-86, Cl. D3-74.000.

Bate, Peter, to Dominion Odor Control Ltd. Germicidal disc container for sterilizing a telephone mouthpiece. 283,128, 3-25-86, Cl. D14-59.000.

Bathker, Daniel A.: *See*—
Fourcher, Frederic; Bathker, Daniel A.; and Cole, Thomas W., 283,129, Cl. D14-90.000.

Bayerische Motoren Werke AG: *See*—
Abe, Karl H.; and Gevert, Klaus V., 283,119, Cl. D12-182.000.

Bigando, Donald E., to International Business Machines Corporation. Packaging container for computer software. 283,104, 3-25-86, Cl. D9-418.000.

Boenning, Charles B., to Claiborne Electronics, Inc. Combined door viewer and two-way intercom unit. 283,130, 3-25-86, Cl. D14-92.000.

Bott, John A. Vehicle luggage rack stanchion. 283,117, 3-25-86, Cl. D12-157.000.

Bouchard, Andre C.: *See*—
Wierzbicki, Julian J.; Hough, Harold L.; and Bouchard, Andre C., 283,169, Cl. D26-3.000.

Chaussures Mephisto S.A.: *See*—
Michaeli, Martin, 283,079, Cl. D2-320.000.
Michaeli, Martin, 283,080, Cl. D2-322.000.

Chicago Cutlery Consumer Products, Inc.: *See*—
Tolentino, John R., 283,093, Cl. D6-470.000.

Claiborne Electronics, Inc.: *See*—
Boenning, Charles B., 283,130, Cl. D14-92.000.

Cole, Thomas W.: *See*—
Fourcher, Frederic; Bathker, Daniel A.; and Cole, Thomas W., 283,129, Cl. D14-90.000.

Collister, Kenneth D., to Miles Laboratories, Inc. Reflectance photometer. 283,107, 3-25-86, Cl. D10-46.000.

Compton, Fred A. Paper towel holder. 283,095, 3-25-86, Cl. D6-521.000.

Coyne, Patrick J., to Meritus Industries, Inc. Toy mannequin. 283,148, 3-25-86, Cl. D21-154.000.

Crandall, Melvin. Racquet sports shorts. 283,077, 3-25-86, Cl. D2-42.000.

Cunning, Joseph M., to Armatron International, Inc. Housing for electronic insect killer. 283,152, 3-25-86, Cl. D22-19.000.

Cushing, John J.; and Driscoll, John S., to Driscoll, John S. Combined packaging and shipping container. 283,103, 3-25-86, Cl. D9-345.000.

Daenen, Robert H. C. M.; and DeCoster, Pieter K. J., to Dart Industries Inc. Gelatin mold or the like. 283,097, 3-25-86, Cl. D7-43.000.

Daly, Lewis J. Pool access stair for the disabled. 283,168, 3-25-86, Cl. D25-62.000.

Dart Industries Inc.: *See*—
Daenen, Robert H. C. M.; and DeCoster, Pieter K. J., 283,097, Cl. D7-43.000.

Davidson, Grant M. N., to U.S. Philips Corporation. Loudspeaker panel. 283,125, 3-25-86, Cl. D14-39.000.

DeCoster, Pieter K. J.: *See*—
Daenen, Robert H. C. M.; and DeCoster, Pieter K. J., 283,097, Cl. D7-43.000.

Deemer, Milton G. Combined endodontic X-ray mounts and postal card correspondence form. 283,139, 3-25-86, Cl. D19-2.000.

Design Institute America, Inc.: *See*—
Mulhauser, George C., 283,090, Cl. D6-372.000.

DeYoreo, Sal, to Armatron International, Inc. Housing for electronic insect killer. 283,153, 3-25-86, Cl. D22-19.000.

Dominion Odor Control Ltd.: *See*—
Bate, Peter, 283,128, Cl. D14-59.000.

Dornbusch, Arthur H.; and Haintl, Barbara A., to Procter & Gamble Company, The. Carton blank. 283,105, 3-25-86, Cl. D9-433.000.

Double D Specialties, Inc.: *See*—
Trombley, Ulric W.; and Nozel, Richard J., 283,120, Cl. D12-190.000.

Driscoll, John S.: *See*—
Cushing, John J.; and Driscoll, John S., 283,103, Cl. D9-345.000.

Eklund, Tore. Load carrier attachment for cars and similar vehicles. 283,118, 3-25-86, Cl. D12-157.000.

Fire Arrow, Inc.: *See*—
Stollery, David J., 283,113, Cl. D12-85.000.

Fourcher, Frederic; Bathker, Daniel A.; and Cole, Thomas W., to Miralite International, Inc. Microwave feed horn. 283,129, 3-25-86, Cl. D14-90.000.

Franovic, Michael: *See—*
Oesterheld, Klaus; Franovic, Michael; and Martinez, Carlos, 283,121, Cl. D13-25.000.
Fukuchi, Eiji, to Mitsuboshi Belting Ltd. Bicycle tire tread. 283,114, 3-25-86, Cl. D12-136.000.
Fukuchi, Eiji, to Mitsuboshi Belting Ltd. Bicycle tire tread. 283,115, 3-25-86, Cl. D12-136.000.
Funabashi, Genichi; Teraoka, Akira; and Nakamura, Tadashi, to Kubota Ltd. Agricultural tractor. 283,135, 3-25-86, Cl. D15-23.000.
Gamm, Robert J., to Kangaroos U.S.A, Inc. Athletic shoe with pocket cover flap. 283,078, 3-25-86, Cl. D2-309.000.
Gardner, Glen A.; Kung, Richard J.; and Salzberger, Claude E., to Krystal Company, The. Food service building. 283,166, 3-25-86, Cl. D25-1.000.
Gem Products, Inc.: *See—*
McKinnon, Eugene T., 283,154, Cl. D23-40.000.
General Electric Company: *See—*
Newgard, Jon M.; and Pitts, Walter C., 283,170, Cl. D26-71.000.
Gevert, Klaus V.: *See—*
Abe, Karl H.; and Gevert, Klaus V., 283,119, Cl. D12-182.000.
Gillette Company, The: *See—*
Petrillo, Richard J., 283,140, Cl. D19-49.000.
Godsey, James H., to American Home Products Corporation (Del.). Combined microbiological test tray and holder. 283,159, 3-25-86, Cl. D24-31.000.
Godsey, James H., to American Home Products Corporation (Del.). Combined microbiological test tray and holder. 283,161, 3-25-86, Cl. D24-31.000.
Godsey, James H., to American Home Products Corporation (Del.). Microbiological test tray. 283,162, 3-25-86, Cl. D24-31.000.
GTE Products Corporation: *See—*
Wierzbicki, Julian J.; Hough, Harold L.; and Bouchard, Andre C., 283,169, Cl. D26-3.000.
Haase, William H.: *See—*
Murdick, Brian K.; and Haase, William H., 283,098, Cl. D7-76.000.
Hai-Ping, Chan, to National Telecommunication System, Ltd. Telephone receiver and base set. 283,127, 3-25-86, Cl. D14-53.000.
Haintl, Barbara A.: *See—*
Dornbusch, Arthur H.; and Haintl, Barbara A., 283,105, Cl. D9-433.000.
Hamar, Christopher J., to Zengrange Limited. Combined calculator and protective case. 283,137, 3-25-86, Cl. D18-2.000.
Hamar, Christopher J., to Zengrange Limited. Protective case for a calculator or the like. 283,138, 3-25-86, Cl. D18-11.000.
Hansen, Bernadette G. Purse. 283,081, 3-25-86, Cl. D3-53.000.
Hansen, Bernadette G. Clutch bag. 283,082, 3-25-86, Cl. D3-53.000.
Hartman Products: *See—*
Weinhart, Ronald, 283,086, Cl. D6-308.000.
Hough, Harold L.: *See—*
Wierzbicki, Julian J.; Hough, Harold L.; and Bouchard, Andre C., 283,169, Cl. D26-3.000.
Hudson, Walter H. Mechanical drawing implement. 283,110, 3-25-86, Cl. D10-62.000.
Interlego AG: *See—*
Jensen, Carlo A., 283,150, Cl. D21-177.000.
Nielsen, Jacob, 283,149, Cl. D21-157.000.
International Business Machines Corporation: *See—*
Bigando, Donald E., 283,104, Cl. D9-418.000.
Mendel, Peter J., 283,134, Cl. D14-113.000.
Jackson, Frank W., to Jackson, Frank W. Endoscopic bite block. 283,158, 3-25-86, Cl. D24-29.000.
Jensen, Carlo A., to Interlego AG. Toy diver figure with hoist. 283,150, 3-25-86, Cl. D21-177.000.
Jensen, Fritz. Spaceship toy balloon. 283,144, 3-25-86, Cl. D21-84.000.
Jensen, Fritz. Simulative toy balloon. 283,145, 3-25-86, Cl. D21-84.000.
Jensen, Fritz. Butterfly toy balloon. 283,146, 3-25-86, Cl. D21-84.000.
Johnson, Robert E. Picture frame. 283,085, 3-25-86, Cl. D6-303.000.
Johnston, Joan O. Computer work station. 283,092, 3-25-86, Cl. D6-423.000.
Kangaroos U.S.A, Inc.: *See—*
Gamm, Robert J., 283,078, Cl. D2-309.000.
Knief, Fred E. Therapeutic exercising machine. 283,151, 3-25-86, Cl. D21-194.000.
Kokomo Spring Company: *See—*
Petro, Eli J.; and Pemberton, Paul E., 283,102, Cl. D8-349.000.
Kolb, Ronald M., to Shure Brothers, Inc. Microphone. 283,124, 3-25-86, Cl. D14-12.000.
Koves, Thomas. Clipboard. 283,141, 3-25-86, Cl. D19-88.000.
Krystal Company, The: *See—*
Gardner, Glen A.; Kung, Richard J.; and Salzberger, Claude E., 283,166, Cl. D25-1.000.
Kubota Ltd.: *See—*
Funabashi, Genichi; Teraoka, Akira; and Nakamura, Tadashi, 283,135, Cl. D15-23.000.
Kung, Richard J.: *See—*
Gardner, Glen A.; Kung, Richard J.; and Salzberger, Claude E., 283,166, Cl. D25-1.000.
Lewis, Milton. Game board. 283,142, 3-25-86, Cl. D21-34.000.
Loughry, Clark E.: *See—*
Maldonado, Robert; and Loughry, Clark E., 283,157, Cl. D24-2.000.
Lutz, Christina. Combined picture frame and storage box. 283,087, 3-25-86, Cl. D6-314.000.
Lymburner, Kenneth G. Wrench support. 283,101, 3-25-86, Cl. D8-71.000.
Maldonado, Robert; and Loughry, Clark E., to S. S. White Company, The. Device for positioning dental x-ray film. 283,157, 3-25-86, Cl. D24-2.000.
Mandelli, Franco: *See—*
Mandelli, Piergiorgio; and Mandelli, Franco, 283,156, Cl. D23-158.000.
Mandelli, Piergiorgio; and Mandelli, Franco. Electric fan. 283,156, 3-25-86, Cl. D23-158.000.
Marshall, Eric J. Telephone. 283,126, 3-25-86, Cl. D14-53.000.
Martinez, Carlos: *See—*
Oesterheld, Klaus; Franovic, Michael; and Martinez, Carlos, 283,121, Cl. D13-25.000.
Matsumoto, Nobuki, to Ricoh Company, Ltd. Printer for electronic computer. 283,132, 3-25-86, Cl. D14-111.000.
McArdle, Peter A., to Trimtech Limited. Seat. 283,089, 3-25-86, Cl. D6-367.000.
McFrisby, Samuel J., to Ulicne, Joseph A., a part interest. Articulated, collapsible sled. 283,112, 3-25-86, Cl. D12-10.000.
McKay, Stewart K. Lounge chair. 283,088, 3-25-86, Cl. D6-361.000.
McKinnon, Eugene T., to Gem Products, Inc. Air manifold unit. 283,154, 3-25-86, Cl. D23-40.000.
Meekins, Gilbert F., to United Way of America. Trophy. 283,111, 3-25-86, Cl. D11-161.000.
Mendel, Peter J., to International Business Machines Corporation. Display for data-processing workstation. 283,134, 3-25-86, Cl. D14-113.000.
Meritus Industries, Inc.: *See—*
Coyne, Patrick J., 283,148, Cl. D21-154.000.
Meyer, Gene. Floral stand. 283,091, 3-25-86, Cl. D6-403.000.
Michaeli, Martin, to Chaussures Mephisto S.A. Shoe soles. 283,079, 3-25-86, Cl. D2-320.000.
Michaeli, Martin, to Chaussures Mephisto S.A. Shoe sole. 283,080, 3-25-86, Cl. D2-322.000.
Miles Laboratories, Inc.: *See—*
Collister, Kenneth D., 283,107, Cl. D10-46.000.
Miralite International, Inc.: *See—*
Fourcher, Frederic; Bathker, Daniel A.; and Cole, Thomas W., 283,129, Cl. D14-90.000.
Mitsuboshi Belting Ltd.: *See—*
Fukuchi, Eiji, 283,114, Cl. D12-136.000.
Fukuchi, Eiji, 283,115, Cl. D12-136.000.
Mulhauser, George C., to Design Institute America, Inc. Chair. 283,090, 3-25-86, Cl. D6-372.000.
Murdick, Brian K.; and Haase, William H. Taco tray. 283,098, 3-25-86, Cl. D7-76.000.
Nakade, Kenichi; and Toyoshima, Masami, to Ricoh Company, Ltd. Printer for electronic computer. 283,133, 3-25-86, Cl. D14-111.000.
Nakamura, Tadashi: *See—*
Funabashi, Genichi; Teraoka, Akira; and Nakamura, Tadashi, 283,135, Cl. D15-23.000.
Nakatani, Akihiro, to Sumitomo Rubber Industries Ltd. Vehicle tire. 283,116, 3-25-86, Cl. D12-147.000.
National Telecommunication System, Ltd.: *See—*
Hai-Ping, Chan, 283,127, Cl. D14-53.000.
Newgard, Jon M.; and Pitts, Walter C., to General Electric Company. Roadway luminaire. 283,170, 3-25-86, Cl. D26-71.000.
Nielsen, Jacob, to Interlego AG. Toy walrus figure. 283,149, 3-25-86, Cl. D21-157.000.
North American Philips Corporation: *See—*
Oesterheld, Klaus; Franovic, Michael; and Martinez, Carlos, 283,121, Cl. D13-25.000.
Nozel, Richard J.: *See—*
Trombley, Ulric W.; and Nozel, Richard J., 283,120, Cl. D12-190.000.
Oesterheld, Klaus; Franovic, Michael; and Martinez, Carlos, to North American Philips Corporation. Fluorescent lamp holder. 283,121, 3-25-86, Cl. D13-25.000.
Ozalid Corporation: *See—*
Serbinski, Andrew T., 283,136, Cl. D16-27.000.
Pandya, Mahendra K. Organizer for holding drug detection kit articles or the like. 283,163, 3-25-86, Cl. D24-31.000.
Pandya, Mahendra K. Organizer for holding drug detection kit articles or the like. 283,164, 3-25-86. Cl. D24-31.000.
Parks, Edward D.: *See—*
Smith, Gary E.; and Parks, Edward D., 283,171, Cl. D34-21.000.
Pemberton, Paul E.: *See—*
Petro, Eli J.; and Pemberton, Paul E., 283,102, Cl. D8-349.000.
Percom Data Corporation: *See—*
Baker, Daniel A., 283,131, Cl. D14-109.000.
Perry, George. Stationary refreshment stand. 283,167, 3-25-86, Cl. D25-10.000.
Petrillo, Richard J., to Gillette Company, The. Writing instrument. 283,140, 3-25-86, Cl. D19-49.000.
Petro, Eli J.; and Pemberton, Paul E., to Kokomo Spring Company. Spring bracket. 283,102, 3-25-86, Cl. D8-349.000.
Pitts, Walter C.: *See—*
Newgard, Jon M.; and Pitts, Walter C., 283,170, Cl. D26-71.000.
Porter, Robert H. Tool holder. 283,100, 3-25-86, Cl. D8-71.000.
Procter & Gamble Company, The: *See—*
Dornbusch, Arthur H.; and Haintl, Barbara A., 283,105, Cl. D9-433.000.
Ricoh Company, Ltd.: *See—*
Matsumoto, Nobuki, 283,132, Cl. D14-111.000.
Nakade, Kenichi; and Toyoshima, Masami, 283,133, Cl. D14-111.000.

Ronvik, John P., to Sears, Roebuck & Co. Pedestal sink. 283,155, 3-25-86, Cl. D23-61.000.
Roshoff, Kennert. Crack-indication element. 283,109, 3-25-86, Cl. D10-46.000.
Ruhf, Peter R.; and Smirne, Frank S. Boomerang. 283,143, 3-25-86, Cl. D21-82.000.
S. S. White Company, The: *See*—
Maldonado, Robert; and Loughry, Clark E., 283,157, Cl. D24-2.000.
Salzberger, Claude E.: *See*—
Gardner, Glen A.; Kung, Richard J.; and Salzberger, Claude E., 283,166, Cl. D25-1.000.
Saumell, Luis E. Standard projector marker for marking optical lenses. 283,108, 3-25-86, Cl. D10-46.000.
Scott Orthopedics, Inc.: *See*—
Womack, Darryl L., 283,165, Cl. D24-64.000.
Sears, Roebuck & Co.: *See*—
Ronvik, John P., 283,155, Cl. D23-61.000.
Serbinski, Andrew T., to Ozalid Corporation. Copying machine. 283,136, 3-25-86, Cl. D16-27.000.
Shabram, Lyle F., Jr.: *See*—
Shabram, Lyle F., Sr.; and Shabram, Lyle F., Jr., 283,099, Cl. D7-392.000.
Shabram, Lyle F., Sr.; and Shabram, Lyle F., Jr. Condiment container closure. 283,099, 3-25-86, Cl. D7-392.000.
Shure Brothers, Inc.: *See*—
Kolb, Ronald M., 283,124, Cl. D14-12.000.
Smirne, Frank S.: *See*—
Ruhf, Peter R.; and Smirne, Frank S., 283,143, Cl. D21-82.000.
Smith, Gary E.; and Parks, Edward D. Cart for holding rolls of wire. 283,171, 3-25-86, Cl. D34-21.000.
Sony Corporation: *See*—
Sumita, Kaoru, 283,122, Cl. D14-5.000.
Sumita, Kaoru, 283,123, Cl. D14-6.000.
States, Thomas J., Jr. Chewing tobacco can holder. 283,076, 3-25-86, Cl. D2-400.000.
Stednitz, Denis P., to Ace Orthopedic Company Inc. Orthopedic tool box. 283,083, 3-25-86, Cl. D3-74.000.
Steinman, Mark E. Equipment storage tray or the like. 283,160, 3-25-86, Cl. D24-31.000.
Stollery, David J., to Fire Arrow, Inc. Body for three-wheeled motor vehicle. 283,113, 3-25-86, Cl. D12-85.000.
Strand, David R.; and Turnbull, C. Douglas, to Strand Inc. Computer desk. 283,094, 3-25-86, Cl. D6-478.000.
Strand Inc.: *See*—
Strand, David R.; and Turnbull, C. Douglas, 283,094, Cl. D6-478.000.
Sumita, Kaoru, to Sony Corporation. Combined tape player and radio. 283,122, 3-25-86, Cl. D14-5.000.
Sumita, Kaoru, to Sony Corporation. Tape player. 283,123, 3-25-86, Cl. D14-6.000.
Sumitomo Rubber Industries Ltd.: *See*—
Nakatani, Akihiro, 283,116, Cl. D12-147.000.
Teraoka, Akira: *See*—
Funabashi, Genichi; Teraoka, Akira; and Nakamura, Tadashi, 283,135, Cl. D15-23.000.
Tolentino, John R., to Chicago Cutlery Consumer Products, Inc. Display case for cutlery merchandise or the like. 283,093, 3-25-86, Cl. D6-470.000.
Toyoshima, Masami: *See*—
Nakade, Kenichi; and Toyoshima, Masami, 283,133, Cl. D14-111.000.
Trimtech Limited: *See*—
McArdle, Peter A., 283,089, Cl. D6-367.000.
Trombley, Ulric W.; and Nozel, Richard J., to Double D Specialties, Inc. Trim piece for an automobile hood. 283,120, 3-25-86, Cl. D12-190.000.
Turnbull, C. Douglas: *See*—
Strand, David R.; and Turnbull, C. Douglas, 283,094, Cl. D6-478.000.
Uhrik, Gary J. Cereal bowl or the like. 283,096, 3-25-86, Cl. D7-27.000.
Ulicne, Joseph A.: *See*—
McFrisby, Samuel J., 283,112, Cl. D12-10.000.
U.S. Philips Corporation: *See*—
Davidson, Grant M. N., 283,125, Cl. D14-39.000.
United Way of America: *See*—
Meekins, Gilbert F., 283,111, Cl. D11-161.000.
Weinhart, Ronald, to Hartman Products. Lighted mirror. 283,086, 3-25-86, Cl. D6-308.000.
Wierzbicki, Julian J.; Hough, Harold L.; and Bouchard, Andre C., to GTE Products Corporation. Fluorescent lamp or the like. 283,169, 3-25-86, Cl. D26-3.000.
Womack, Darryl L., to Scott Orthopedics, Inc. Thigh component for a knee brace. 283,165, 3-25-86, Cl. D24-64.000.
Yang, Tai-Her. Timer. 283,106, 3-25-86, Cl. D10-40.000.
Yang, Yeong F. Sledge toy. 283,147, 3-25-86, Cl. D21-149.000.
Zengrange Limited: *See*—
Hamar, Christopher J., 283,137, Cl. D18-2.000.
Hamar, Christopher J., 283,138, Cl. D18-11.000.

LIST OF PLANT PATENTEES

Gessellschaftsvertrag uber die Ergindergemeinschaft "OPTIMARA": *See*—
Holtkamp, Reinhold, 5,700, Cl. 69.000.
Holtkamp, Reinhold, 5,701, Cl. 69.000.
Holtkamp, Reinhold, to Gessellschaftsvertrag uber die Ergindergemeinschaft "OPTIMARA". African violet plant named Improved Orlando. 5,700, 3-25-86, Cl. 69.000.
Holtkamp, Reinhold, to Gessellschaftsvertrag uber die Ergindergemeinschaft "OPTIMARA". African violet plant named Maui. 5,701, 3-25-86, Cl. 69.000.
Hope, Claude, to Pan American Plant Co. Impatiens plant named Vista Impatiens No. 44. 5,698, 3-25-86, Cl. 68.000.
Hope, Claude, to Pan American Plant Co. Impatiens plant named Vista Impatiens No. 60. 5,699, 3-25-86, Cl. 68.000.
Jennings, Derek L., to National Seed Development Organisation Limited. Tummelberry. 5,697, 3-25-86, Cl. 46.000.
National Seed Development Organisation Limited: *See*—
Jennings, Derek L., 5,697, Cl. 46.000.
Pan American Plant Co.: *See*—
Hope, Claude, 5,698, Cl. 68.000.
Hope, Claude, 5,699, Cl. 68.000.

CLASSIFICATION OF PATENTS

ISSUED MARCH 25, 1986

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

2 4,577,346
6 4,577,347
84 4,577,348

CLASS 4

203 4,577,349
251 4,577,350
460 4,577,351
499 4,577,352
544 4,577,353
585 4,577,354

CLASS 5

93 R 4,577,355
450 4,577,356
451 4,577,357
455 4,577,358

CLASS 8

115.52 4,578,166
115.61 4,578,084
152 4,578,085

CLASS 10

10 R 4,577,359

CLASS 12

115.6 4,577,360

CLASS 15

21 R 4,577,361
256.5 4,577,362
4,577,363
320 4,577,364
339 4,577,365
388 4,577,366

CLASS 16

114 A 4,577,367

CLASS 17

11 4,577,368
46 4,577,369
49 4,577,370
62 4,577,371

CLASS 19

159 A 4,577,372

CLASS 23

300 4,578,086

CLASS 24

90 B 4,577,373
165 4,577,374
580 4,577,375
624 4,577,376
625 4,577,377
635 4,577,378

CLASS 29

149.5 S 4,577,379
157.3 C 4,577,380
157.4 4,577,381
229 4,577,382
281.1 4,577,383
402.18 4,577,385
455 R 4,577,386
458 4,577,387
460 4,577,384
558 4,577,388
568 4,577,389
570 4,577,390
571 4,577,391
4,577,392
572 4,577,393
576 B 4,577,396
4,577,397
576 C 4,577,395
576 W 4,577,394
590 4,577,398
733 4,577,399
739 4,577,400
825 4,577,401
840 4,577,402
872 4,577,403
874 4,577,404

CLASS 30

90.1 4,577,405
103 4,577,406
180 4,577,407
222 4,577,408

CLASS 33

18.1 4,577,409
129 4,577,410
141 E 4,577,411
172 R 4,577,412
203.18 4,577,413
363 K 4,577,414
430 4,577,415
561 4,577,416

CLASS 36

29 4,577,417
72 B 4,577,418
89 4,577,419
117 4,577,420
119 4,577,421
126 4,577,422

CLASS 37

142 R 4,577,423

CLASS 38

88 4,577,424

CLASS 40

19 4,577,425
21 R 4,577,426
449 4,577,427
518 4,577,428

CLASS 42

59 4,577,429
69 R 4,577,430
76 A 4,577,431

CLASS 43

23 4,577,432
57.2 4,577,433
115 4,577,434

CLASS 47

2 4,577,435
17 4,577,436

CLASS 49

25 4,577,437
57 4,577,438
352 4,577,439

CLASS 51

168 4,577,440
295 4,578,087
419 4,577,441

CLASS 52

57 4,577,442
230 4,577,443
311 4,577,444
396 Re.32,096
403 4,577,445
425 4,577,446
571 4,577,447
584 4,577,448
721 4,577,449
787 4,577,450

CLASS 53

58 4,577,451
266 R 4,577,452
438 4,577,453
492 4,577,454

CLASS 55

2 4,578,088
26 4,578,089
48 4,578,090
90 4,578,091
302 4,578,092

CLASS 56

13.6 4,577,456
17.1 4,577,455
235 4,577,457

CLASS 57

22 4,577,458
4,577,459

CLASS 60

39.35 4,577,460
203.1 4,577,461
262 4,577,462
426 4,577,463
531 4,577,464

CLASS 62

12 4,578,093
17 4,578,094
22 4,578,095
55.5 4,577,465
63 4,577,466
82 4,577,467
113 4,577,468
126 4,577,469
259.4 4,577,470
271 4,577,471
324.6 4,577,472
347 4,577,473
457 4,577,474
4,577,475

CLASS 65

3.11 4,578,096
4,578,097
13 4,578,098
26 4,578,099
60.8 4,578,100
109 4,578,101
114 4,578,102
182.2 4,578,103
267 4,578,104

CLASS 68

5 D 4,577,476

CLASS 70

58 4,577,477
168 4,577,478
364 A 4,577,479

CLASS 71

28 4,578,105
92 4,578,106
4,578,107
93 4,578,108

CLASS 72

8 4,577,480
68 4,577,481
201 4,577,482
214 4,577,483
245 4,577,484
402 4,577,485
421 4,577,486

CLASS 73

37 4,577,487
40 4,577,488
40.7 4,577,489
4,577,490
60.1 4,577,491
61.1 C 4,577,492
81 4,577,493
105 4,577,494
118 4,577,495
119 A 4,577,496
126 4,577,497
198 4,577,498
432 R 4,577,499
577 4,577,501
579 4,577,500
600 4,577,502
602 4,577,503
606 4,577,504
629 4,577,505
633 4,577,506
640 4,577,507
655 4,577,508
658 4,577,509
708 4,577,510
756 4,577,511
862.04 4,577,513
862.45 4,577,512
863.01 4,577,514
863.73 4,577,515
864.41 4,577,516
864.81 4,577,517
864.91 4,577,518

CLASS 74

5 F 4,577,519
84 R 4,577,520
89.2 4,577,521
127 4,577,522
200 4,577,523
411.5 4,577,524
440 4,577,525
609 4,577,526
640 4,577,527
665 GA 4,577,528
4,577,529
713 4,577,530
781 B 4,577,531
841 4,577,532

CLASS 75

0.5 C 4,578,109
34 4,578,110
65 R 4,578,111
108 4,578,112
124 4,578,113
252 4,578,114
255 4,578,115

CLASS 76

41 4,577,533

CLASS 81

484 4,577,534

CLASS 82

2 E 4,577,535
2.7 4,577,536

CLASS 83

343 4,577,537
467 R 4,577,538
886 4,577,539

CLASS 84

1.27 4,577,540
411 R 4,577,541

CLASS 86

20 D 4,577,542

CLASS 87

11 4,577,543

CLASS 89

1.14 4,577,544
8 4,577,545
41.19 4,577,546

CLASS 91

39 4,577,547
369 A 4,577,548

CLASS 92

169 4,577,549

CLASS 99

329 RT 4,577,550
348 4,577,551
524 4,577,552

CLASS 100

4 4,577,553
26 4,577,554

CLASS 101

76 4,577,555
148 4,577,556
217 4,577,557
221 4,577,559
365 4,577,558
415.1 4,577,560

CLASS 102

215 4,577,561
384 Re.32,094

CLASS 106

18.12 4,578,116
20 4,578,117
288 B 4,578,118

CLASS 109

24.1 4,577,562
52 4,577,563

CLASS 110

110 4,577,564
237 4,577,565
343 4,577,566
347 4,577,567

CLASS 111

7 4,577,568

CLASS 112

83 4,577,569
121.12 4,577,570
121.15 4,577,571
231 4,577,572
318 4,577,573
445 4,577,574
449 4,577,575
456 4,577,576

CLASS 114

120 4,577,577
248 4,577,578
274 4,577,579
285 4,577,580
294 4,577,581
298 4,577,582
332 4,577,583

CLASS 116

10 4,577,584

CLASS 118

50 4,577,585
63 4,577,586
658 4,577,587
665 4,577,588

CLASS 119

17 4,577,589
29 4,577,590
143 4,577,591

CLASS 122

235 D 4,577,593

CLASS 123

41.08 4,577,594
41.35 4,577,595
52 MV 4,577,596
73 A 4,577,597
90.15 4,577,592
90.18 4,577,598
179 B 4,577,599
270 4,577,600
298 4,577,601
306 4,577,602
339 4,577,603
397 4,577,604
479 4,577,605
506 4,577,606
516 4,577,607
583 4,577,608
602 4,577,609
633 4,577,610
669 4,577,611

CLASS 124

41 A 4,577,612

CLASS 125

23 C 4,577,613
25 4,577,614

CLASS 126

99 A 4,577,615
110 R 4,577,616
279 4,577,617
415 4,577,618
431 4,577,619
440 4,577,620

CLASS 128

4 4,577,621
24 R 4,577,622
25 R 4,577,623
40 4,577,624
57 4,577,625
64 4,577,626
76 R 4,577,627
205.26 4,577,628
305 4,577,629
314 4,577,630
334 R 4,577,631
360 4,577,632
419 PG 4,577,633
4,577,634
642 4,577,635
654 4,577,636
658 4,577,637
671 4,577,638
709 4,577,639
738 4,577,640
746 4,577,641
784 4,577,642
785 4,577,643

CLASS 131

94 4,577,644
196 4,577,645
275 Re.32,095
296 4,577,646

CLASS 132

39 4,577,647
73 4,577,648
93 4,577,649

CLASS 134

4 4,578,119
9 4,578,120
25.4 4,578,121
59 4,577,650
111 4,577,651

CLASS 136

251 4,578,526
256 4,578,527

CLASS 137

82 4,577,652
119 4,577,653
219 4,577,654
375 4,577,655
4,577,656
448 4,577,657
599 4,577,658
614.06 4,577,659
625.24 4,577,660
625.33 4,577,661
630.14 4,577,662

CLASS 138

31 4,577,663
149 4,577,664

CLASS 139

431 4,577,665
450 4,577,666

CLASS 144

193 C 4,577,667

CLASS 148

6.2 4,578,122
11.5 Q 4,578,123
12 F 4,578,124
31.57 4,578,125
171 4,578,126
175 4,578,127
191 4,578,128
407 4,578,129
419 4,578,130

CLASS 152

520 4,577,668

CLASS 156

62 4,578,131
72 4,578,132
164 4,578,133
167 4,578,134
182 4,578,135
249 4,578,136
345 4,578,137
361 4,578,138
384 4,578,139
4,578,140
439 4,578,141
612 4,578,142
616 R 4,578,145
617 R 4,578,143
4,578,144
623 R 4,578,146

CLASS 162

26 4,578,147
4,578,148
39 4,578,149
164.3 4,578,150

CLASS 164

45 4,577,669
155 4,577,670
401 4,577,671
428 4,577,672
448 4,577,673
4,577,674
4,577,675
468 4,577,676

CLASS 165

1 4,577,677

10 4,577,678
45 4,577,679
95 4,577,680
109.1 4,577,681
160 4,577,682
164 4,577,683
172 4,577,684

CLASS 166

115 4,577,685
208 4,577,686
243 4,577,687
245 4,577,688
250 4,577,689
251 4,577,690
263 4,577,691
321 4,577,692
338 4,577,693
382 4,577,694
387 4,577,695
4,577,696

CLASS 172

21 4,577,697
225 4,577,698
570 4,577,699

CLASS 174

65 G 4,578,528
117 FF 4,578,529

CLASS 175

40 4,577,700
61 4,577,701
65 4,577,702
79 4,577,703
107 4,577,704
228 4,577,705
329 4,577,706

CLASS 177

25 4,577,707
145 4,577,708
211 4,577,709
245 4,577,710

CLASS 178

22.08 4,578,531
22.09 4,578,530
22.13 4,578,532

CLASS 179

2 A 4,578,539
4,578,540
2 AM 4,578,536
2 C 4,578,534
2 DP 4,578,533
4,578,535
4,578,537
4,578,538
18 FA 4,578,541
84 L 4,578,542
170.2 4,578,543
4,578,544
178 4,578,545

CLASS 180

9.1 4,577,717
24.1 4,577,711
53.4 4,577,712
69.1 4,577,713
70.1 4,577,714
79.1 4,577,715
4,577,716
179 4,577,718
219 4,577,719
229 4,577,720
248 4,577,721
315 4,577,722

CLASS 181

120 4,577,723
265 4,577,724

CLASS 182

48 4,577,725
93 4,577,726
128 4,577,727

CLASS 184

7.4 4,577,728

CLASS 187

95 4,577,729

CLASS 188

67 4,577,730
4,577,732
73.33 4,577,731
217 4,577,733
218 R 4,577,734
268 4,577,735
371 4,577,736

CLASS 191

87 4,578,546

CLASS 192

0.032 4,577,737
18 A 4,577,738
61 4,577,739
70.18 4,577,740
85 V 4,577,741
106.2 4,577,742
4,577,743

CLASS 194

318 4,577,744

CLASS 198

420 4,577,745
462 4,577,746
500 4,577,747
621 4,577,748
805 4,577,749

CLASS 200

11 DA 4,578,547
38 F 4,578,548
76 4,578,549
144 B 4,578,550
153 SC 4,578,551

CLASS 203

1 4,578,151
4,578,152
99 4,578,153

CLASS 204

1 T 4,578,154
15 4,578,155
4,578,157
33 4,578,156
44.2 4,578,158
98 4,578,159
4,578,160
102 4,578,161
107 4,578,162
110 4,578,163
129.55 4,578,164
157.75 4,578,165
183.1 4,578,167
299 R 4,578,168
4,578,169
400 4,578,170
406 4,578,171
412 4,578,172
416 4,578,173
429 4,578,174

CLASS 206

1.5 4,577,750
77.1 4,577,751
83.5 4,577,752
232 4,577,753
349 4,577,754
370 4,577,755
444 4,577,756
461 4,577,757
496 4,577,758
505 4,577,759
508 4,577,760
604 4,577,761
612 4,577,762

CLASS 208

8 R 4,578,175
4,578,176
45 4,578,177
48 AA 4,578,178
110 4,578,179
4,578,180
4,578,181
112 4,578,182
113 4,578,183

CLASS 209

3 4,578,184
534 4,577,763

CLASS 210

4,578,185
90 4,578,186
93 4,578,187
170 4,578,188
253 4,578,189
321.1 4,578,190
323.2 4,578,191
486 4,578,192
656 4,578,193
673 4,578,194
679 4,578,195
765 4,578,196
772 4,578,197
780 4,578,198
788 4,578,199

CLASS 211

41 4,577,764
75 4,577,765
123 4,577,766
190 4,577,767

CLASS 215

1 C 4,577,768
211 4,577,769
252 4,577,770
256 4,577,771

CLASS 219

10.41 4,578,552
10.77 4,578,553
69 M 4,578,556
121 LC 4,578,554
121 LG 4,578,558
121 PE 4,578,559
121 PP 4,578,557
121 PR 4,578,560
124.34 4,578,561
125.1 4,578,562
273 4,578,563
301 4,578,564
314 4,578,565
521 4,578,566
695 4,578,555

CLASS 220

1.5 4,577,772
22.3 4,577,773
66 4,577,774
4,577,775
307 4,577,776
359 4,577,777
404 4,577,778

CLASS 221

1 4,577,779
125 4,577,780

CLASS 222

54 4,577,781
129.1 4,577,782
386.5 4,577,783
402.2 4,577,784
598 4,577,785

CLASS 224

32 A 4,577,786
243 4,577,787
273 4,577,788

CLASS 225

100 4,577,789

CLASS 226

118 4,577,790
142 4,577,791
162 4,577,792

CLASS 227

10 4,577,793
119 4,577,794

CLASS 228

29 4,577,795
102 4,577,796
118 4,577,797
157 4,577,798

CLASS 229

40 4,577,799

CLASS 235

380 4,578,567
436 4,578,568
454 4,578,569
463 4,578,570
472 4,578,571
4,578,572
492 4,578,573

CLASS 237

2 A 4,577,800

CLASS 238

283 4,577,801

CLASS 239

11 4,577,802
690 4,577,803

CLASS 241

16 4,577,804
101 B 4,577,805
275 4,577,806

CLASS 242

84.2 C 4,577,807
84.5 R 4,577,808
96 4,577,809
157.1 4,577,810
195 4,577,811

CLASS 244

3.21 4,577,812
3.23 4,577,813
12.5 4,577,814
39 4,577,815
148 4,577,816
4,577,817

CLASS 248

27.3 4,577,818
123.1 4,577,819
211 4,577,820
421 4,577,821
463 4,577,822
487 4,577,823
544 4,577,824
550 4,577,825
638 4,577,826
656 4,577,827
678 4,577,828

CLASS 250

202 4,578,574
203 R 4,578,575
214 A 4,578,576
235 4,578,577
252.1 4,578,578
256 4,578,579
269 4,578,580
327.2 4,578,581
4,578,582
339 4,578,583
341 4,578,584
363 S 4,578,585
382 4,578,586
432 R 4,578,588
492.2 4,578,587
4,578,589
548 4,578,590

CLASS 251

15 4,577,829
84 4,577,830
93 4,577,831
129.11 4,577,832
149.1 4,577,833
175 4,577,834
310 4,577,835
356 4,577,836

CLASS 252

8.55 C 4,578,201
8.8 4,578,200
33.4 4,578,202
49.3 4,578,203
62.2 4,578,204
76 4,578,205
95 4,578,206
134 4,578,207
135 4,578,208
143 4,578,209
299.6 4,578,210
301.17 4,578,213
301.4 F 4,578,212
301.4 H 4,578,211
376 4,578,214
514 4,578,215
542 4,578,216

CLASS 254

212 4,577,837

CLASS 260

112 B 4,578,218
112.5 R 4,578,217
4,578,219
239 R 4,578,220
397.1 4,578,221
413 4,578,222
419 4,578,223
502.5 F 4,578,224
550 4,578,225

CLASS 261

41 D 4,578,228
71 4,578,226
111 4,578,227

CLASS 264

0.5 4,578,229
2.1 4,578,230
25 4,578,231
65 4,578,232
4,578,233
4,578,234
71 4,578,235

CLASS 266

171 4,577,838
272 4,577,839

CLASS 267

64.17 4,577,840
103 4,577,841
140.1 4,577,842

CLASS 269

51 4,577,843
71 4,577,844
73 4,577,845
82 4,577,846
309 4,577,847

CLASS 270

55 4,577,848

CLASS 271

9 4,577,849
22 4,577,850
33 4,577,851
188 4,577,852
217 4,577,853
227 4,577,854
281 4,577,855

CLASS 272

25 4,577,856
67 4,577,857
4,577,858
71 4,577,859
73 4,577,860
96 4,577,861
125 4,577,862

CLASS 273

26 E 4,577,864
26 R 4,577,863
58 G 4,577,865
176 AB 4,577,867
183 A 4,577,868
269 4,577,869

CLASS 277

1 4,577,870
8 4,577,871
12 4,577,872
110 4,577,873
165 4,577,874

CLASS 279

75 4,577,875

CLASS 280

13 4,577,876
33.99 C 4,577,880
47.37 R 4,577,877
242 WC 4,577,878
256 4,577,879
412 4,577,881
446 R 4,577,882
491 D 4,577,883
507 4,577,884
508 4,577,885
602 4,577,886
628 4,577,887
808 4,577,888

CLASS 281

15 R 4,577,889
29 4,577,890

CLASS 285

62 4,577,891
136 4,577,892
158 4,577,893
242 4,577,894
334 4,577,895

CLASS 292

264 4,577,896

CLASS 294

15 4,577,897
88 4,577,898
95 4,577,899
118 4,577,900

CLASS 297

17 4,577,901
85 4,577,902
188 4,577,903
410 4,577,904
411 4,577,905
440 4,577,906
452 4,577,907

CLASS 299

2 4,577,908

CLASS 301

37 TP 4,577,909

CLASS 303

69 4,577,910

CLASS 307

10 R 4,578,591
4,578,592
113 4,578,593
241 4,578,594
252 R 4,578,595
4,578,596
265 4,578,597
271 4,578,598
272 A 4,578,599
451 4,578,600
475 4,578,601
4,578,602
493 4,578,603

CLASS 308

2 R 4,577,911
4,577,912
6 R 4,577,913

CLASS 310

30 4,578,604
67 R 4,578,605
68 R 4,578,606
112 4,578,608
156 4,578,609
4,578,610
328 4,578,607
338 4,578,611
348 4,578,612
800 4,578,613

CLASS 312

10 4,577,914
214 4,577,915
257 R 4,577,916

CLASS 313

309 4,578,614
497 4,578,615
512 4,578,617
563 4,578,618
579 4,578,616
586 4,578,619

CLASS 315

3.5 4,578,620

CLASS 318

6 4,578,621
135 4,578,622
254 4,578,623
305 4,578,624
318 4,578,625
338 4,578,626
632 4,578,627

CLASS 320

2 4,578,628

CLASS 323

217 4,578,629
271 4,578,630
282 4,578,631
315 4,578,632
4,578,633

CLASS 324

56 4,578,634
62 4,578,635
66 4,578,636
73 PC 4,578,637
77 B 4,578,638
96 4,578,639
115 4,578,640
158 D 4,578,641
160 4,578,642
202 4,578,643
212 4,578,644
338 4,578,645

CLASS 328

128 4,578,646

CLASS 330

253 4,578,647
281 4,578,648

CLASS 331

78 4,578,649
160 4,578,650

CLASS 332

7.51 4,578,651

CLASS 333

117 4,578,652
166 4,578,653
175 4,578,654
202 4,578,655
204 4,578,656
211 4,578,657
227 4,578,658

CLASS 335

131 4,578,659
133 4,578,660
212 4,578,661
262 4,578,662
306 4,578,663

CLASS 336

90 4,578,664

CLASS 339

17 M 4,577,918
59 M 4,577,919
143 R 4,577,920
150 T 4,577,917
176 M 4,577,921
176 MP 4,577,922
275 B 4,577,923

CLASS 340

48 4,578,665
146.2 4,578,666
347 DA 4,578,668
347 SH 4,578,667
518 4,578,669
550 4,578,670
636 4,578,671
702 4,578,672

703 4,578,673
710 4,578,674
855 4,578,675

CLASS 343

17.1 R 4,578,676
17.2 PC 4,578,677
357 4,578,678
427 4,578,679
703 4,578,680
786 4,578,681
916 4,578,682

CLASS 346

49 4,578,683
108 Re.32,099
135.1 4,578,684
139 R 4,578,685
140 R 4,578,686
4,578,687
157 4,578,688
160 4,578,689
212 4,578,690

CLASS 350

96.15 4,577,924
96.23 4,577,925
96.25 4,577,926
235 4,577,927
276 R 4,577,928
283 4,577,929
332 4,577,930
350 R 4,577,931
358 4,577,932
4,577,933
430 4,577,934
432 4,577,935
4,577,936
4,577,937
4,577,938
443 4,577,939
502 4,577,940
582 4,577,941

CLASS 351

159 4,577,942
205 4,577,943

CLASS 352

35 4,577,944

CLASS 353

101 4,577,945

CLASS 354

152 4,577,946
275 4,577,947
299 4,577,948
319 4,577,949
324 4,577,950
331 4,577,951
455 4,577,952

CLASS 355

3 BE 4,577,953
4 4,577,954
15 4,577,955
40 4,577,956
43 4,577,957
4,577,958
67 4,577,959
75 4,577,960
77 4,577,961

CLASS 356

5 4,577,962
28.5 4,577,963
39 4,577,964
138 4,577,965
325 4,577,966
349 4,577,967
356 4,577,968
394 4,577,969
440 4,577,970

CLASS 357

5 4,578,691
27 4,578,692
30 4,578,693
41 4,578,694
48 4,578,695
59 4,578,696
75 4,578,697

CLASS 358

22 4,578,698
44 4,578,699
78 4,578,701
84 4,578,700
86 4,578,702
117 4,578,703
135 4,578,704
148 4,578,705
195.1 4,578,706
212 4,578,707
229 4,578,708
230 4,578,709
231 4,578,710
282 4,578,711
4,578,712
283 4,578,713
4,578,714
4,578,715

CLASS 360

1 4,578,716
2 4,578,717
10.3 4,578,718
31 4,578,719
51 4,578,720
4,578,721
60 4,578,722
77 4,578,723
85 4,578,724
4,578,725
99 4,578,726
102 4,578,727
125 4,578,728
134 4,578,729

CLASS 361

4 4,578,730
42 4,578,731
45 4,578,732
120 4,578,733
152 4,578,734
283 4,578,735
306 4,578,736
308 4,578,737
324 4,578,738
395 4,578,739

CLASS 362

66 4,578,740
249 4,578,741
294 4,578,742

CLASS 363

35 4,578,743
37 4,578,744
68 4,578,745
161 4,578,746

CLASS 364

151 4,578,747
167 4,578,748
4,578,749
200 4,578,750
4,578,751
414 4,578,752
4,578,753
426 4,578,754
431.01 4,578,755
431.02 4,578,756
461 4,578,757
466 4,578,758
467 4,578,760
478 4,578,759
481 4,578,761
497 4,578,762
513 4,578,763
4,578,764
514 4,578,765
521 4,578,766
550 4,578,767
560 4,578,768
565 4,578,769
571 4,578,770
716 4,578,771
850 4,578,772
900 4,578,773
4,578,774

CLASS 365

36 4,578,775
149 4,578,776
184 4,578,777
190 4,578,778
4,578,779
4,578,780
203 4,578,781
222 4,578,782

CLASS 366

4,577,971
76 4,577,972
101 4,577,973
139 4,577,974
307 4,577,975
314

CLASS 367

35 4,578,785
99 4,578,783
143 4,578,784

CLASS 369

44 4,578,786
77.2 4,578,787
275 4,578,788

CLASS 370

50 4,578,790
58 4,578,789

CLASS 372

50 4,578,791
58 4,578,792
94 4,578,793

CLASS 373

42 4,578,794
70 4,578,795

CLASS 374

29 4,577,976
39 4,577,977
45 4,577,978
178 4,577,979

CLASS 375

8 4,578,796
25 4,578,797
45 4,578,798
87 4,578,799
106 4,578,800

CLASS 376

136 4,578,236
154 4,578,237
404 4,578,238
441 4,578,239
4,578,240
446 4,578,241

CLASS 378

19 4,578,801
41 4,578,802
62 4,578,803
84 4,578,804
119 4,578,805
162 4,578,806

CLASS 381

7 4,578,807
88 4,578,808
99 4,578,809

CLASS 382

8 4,578,810
11 4,578,811
41 4,578,812

CLASS 383

65 4,578,813
99 4,578,814

CLASS 384

488 4,577,980
495 4,577,981

CLASS 400

17 4,577,982
120 4,577,983
625 4,577,984

CLASS 402

22 4,577,985

CLASS 403

93 4,577,986
133 4,577,987
140 4,577,988
4,577,989
342 4,577,990

CLASS 404

6 4,577,991
16 4,577,992
112 4,577,993
114 4,577,994
117 4,577,995

CLASS 405

17 4,577,996
43 4,577,997
45 4,577,998
53 4,577,999
211 4,578,000

CLASS 406

10 4,578,001
28 4,578,002

CLASS 408

56 4,578,003
87 4,578,004

CLASS 409

140 4,578,005
303 4,578,006

CLASS 413

6 4,578,007

CLASS 414

24.5 4,578,008
43 4,578,009
126 4,578,010
152 4,578,011
310 4,578,012
323 4,578,013
483 4,578,014
513 4,578,015
680 4,578,016

CLASS 415

1 4,578,017
14 4,578,018

CLASS 416

1 4,578,019

CLASS 418

196 4,578,020

CLASS 420

590 4,578,242

CLASS 422

7 4,578,243
56 4,578,245
57 4,578,282
65 4,578,244
111 4,578,246
165 4,578,247
310 4,578,248

CLASS 423

10 4,578,249
22 4,578,250
55 4,578,251
76 4,578,252
87 4,578,253
88 4,578,254
130 4,578,255
210 4,578,256
243 4,578,257
325 4,578,258
329 4,578,259
446 4,578,260
478 4,578,261
522 4,578,262

CLASS 424

1 Re.32,098
15 4,578,263
37 4,578,264
50 4,578,265
63 4,578,266
78 4,578,267
79 4,578,268
88 4,578,269
92 4,578,270
117 4,578,271

CLASS 425

6 4,578,021
7 4,578,022
38 4,578,023
114 4,578,024
133.1 4,578,025
151 4,578,026
298 4,578,027
525 4,578,028

CLASS 426

18 4,578,272
87 4,578,273
96 4,578,274
302 4,578,275
538 4,578,277
565 4,578,276
605 4,578,278

CLASS 427

10 4,578,279
47 4,578,280
53.1 4,578,281
85 4,578,283
163 4,578,284
209 4,578,285
250 4,578,287
327 4,578,286
365 4,578,288
421 4,578,290

CLASS 428

8 4,578,291
31 4,578,292
35 4,578,293
4,578,294
4,578,295
4,578,296
4,578,297
40 4,578,298
65 4,578,299
91 4,578,300
109 4,578,301
110 4,578,302
116 4,578,303
209 4,578,304
212 4,578,305
225 4,578,306
288 4,578,307
297 4,578,308
315.5 4,578,309
334 4,578,310
336 4,578,311
4,578,312
403 4,578,313
4,578,314
414 4,578,315
516 4,578,316
547 4,578,317
615 4,578,318
632 4,578,319
674 4,578,320
693 4,578,321
694 4,578,322

CLASS 429

15 4,578,323
26 4,578,324
91 4,578,325
192 4,578,326
194 4,578,327

CLASS 430

18 4,578,328
4,578,329
37 4,578,330
42 4,578,331
55 4,578,332
59 4,578,334
60 4,578,333
107 4,578,337
120 4,578,338
138 4,578,339
4,578,340
155 4,578,341
159 4,578,342
217 Re.32,097
296 4,578,343
312 4,578,344
393 4,578,345
548 4,578,346
572 4,578,347
607 4,578,348

CLASS 432

14 4,578,029
18 4,578,030
138 4,578,031
230 4,578,032

CLASS 433

29 4,578,033
4,578,034
149 4,578,035

CLASS 434

95 4,578,036
258 4,578,037

CLASS 435

7 4,578,349
4,578,350
41 4,578,351
68 4,578,335
88 4,578,336
99 4,578,352
161 4,578,353
178 4,578,354
317 4,578,355

CLASS 436

31 4,578,356
39 4,578,357
66 4,578,358
4,578,359
518 4,578,360
547 4,578,361

CLASS 440

19 4,578,038
61 4,578,039
73 4,578,040

CLASS 441

30 4,578,041
117 4,578,042

CLASS 445

40 4,578,043

CLASS 446

134 4,578,044
330 4,578,045
376 4,578,046

CLASS 455

15 4,578,815
27 4,578,816
4,578,817
110 4,578,818
135 4,578,819
154 4,578,820

CLASS 464

30 4,578,047
111 4,578,048

CLASS 474

8 4,578,049
17 4,578,050

CLASS 493

8 4,578,051
11 4,578,052
45 4,578,053
126 4,578,054

CLASS 501

17 4,578,362
89 4,578,363
98 4,578,364
4,578,365

CLASS 502

6 4,578,366
24 4,578,367
28 4,578,368
36 4,578,369
37 4,578,370
71 4,578,371
74 4,578,372
113 4,578,373
115 4,578,374
230 4,578,375

CLASS 514

7 4,578,383
8 4,578,384
49 4,578,401
108 4,578,376
206 4,578,377
210 4,578,378
223 4,578,379
4,578,385
232 4,578,380
233 4,578,381
241 4,578,386
245 4,578,382
249 4,578,387
252 4,578,388
254 4,578,389
255 4,578,390
256 4,578,391
300 4,578,392
310 4,578,393
332 4,578,394
356 4,578,395
383 4,578,396
411 4,578,397
4,578,398
455 4,578,399
460 4,578,400
521 4,578,402
522 4,578,403
567 4,578,404
679 4,578,405

CLASS 521

52 4,578,406

CLASS 524

55 4,578,407
91 4,578,408
94 4,578,409
102 4,578,410
156 4,578,411
243 4,578,412
269 4,578,413
310 4,578,414
322 4,578,415
371 4,578,416
378 4,578,417
400 4,578,418
401 4,578,419
490 4,578,420
511 4,578,421
593 4,578,422

CLASS 525

68 4,578,423
109 4,578,424
4,578,425
131 4,578,426
150 4,578,427
265 4,578,428
291 4,578,429
387 4,578,430
4,578,431
417 4,578,433
432 4,578,432
4,578,434
4,578,435
443 4,578,436
444 4,578,437
481 4,578,438
509 4,578,439

CLASS 526

128 4,578,440
216 4,578,441
255 4,578,442
285 4,578,443
288 4,578,444
292.3 4,578,445

CLASS 528

64 4,578,446
73 4,578,447
139 4,578,448
212 4,578,449
254 4,578,450
292 4,578,451

CLASSIFICATION OF PATENTS

297 4,578,452
302 4,578,453
327 4,578,454
501 4,578,455

CLASS 530

502 4,578,456

CLASS 534

632 4,578,457

CLASS 536

123 4,578,458

CLASS 544

8 4,578,459
49 4,578,460
76 4,578,461
177 4,578,462
182 4,578,463
236 4,578,464
285 4,578,465
309 4,578,466
360 4,578,467

CLASS 546

35 4,578,468
66 4,578,469
156 4,578,473
188 4,578,472
4,578,474
193 4,578,471
256 4,578,470

CLASS 548

126 4,578,475
144 4,578,476
165 4,578,477
193 4,578,478
269 4,578,479
533 4,578,480
539 4,578,481

CLASS 549

214 4,578,482
297 4,578,483
360 4,578,484
361 4,578,485
379 4,578,486

CLASS 556

40 4,578,487
56 4,578,488
100 4,578,489
136 4,578,490
137 4,578,491
407 4,578,492
451 4,578,493
452 4,578,494
468 4,578,495
479 4,578,496
4,578,497

CLASS 560

8 4,578,498
21 4,578,499
25 4,578,500
77 4,578,501
79 4,578,502
82 4,578,503
104 4,578,507
112 4,578,504
118 4,578,505
148 4,578,506
221 4,578,508

CLASS 562

462 4,578,509
483 4,578,510
494 4,578,511
586 4,578,512

CLASS 564

56 4,578,513
102 4,578,514
215 4,578,515
479 4,578,516
4,578,517
4,578,518
4,578,519

CLASS 568

315 4,578,520
425 4,578,522
454 4,578,523
771 4,578,521
867 4,578,524
918 4,578,525

CLASS 604

2 4,578,055
6 4,578,056
9 4,578,057
27 4,578,058
43 4,578,059
133 4,578,060
164 4,578,061
174 4,578,062
175 4,578,063
191 4,578,064
336 4,578,065
366 4,578,066
368 4,578,067
4,578,068
370 4,578,069
378 4,578,070
379 4,578,071
385 A 4,578,072
397 4,578,073
408 4,578,074
892 4,578,075
4,578,076

CLASS 623

3 4,578,077
6 4,578,078
11 4,578,079
13 4,578,080
22 4,578,081
26 4,578,082
42 4,578,083

CLASSIFICATION OF DESIGNS

D2— 283,077
309 283,078
320 283,079
322 283,080
400 283,076
D3— 53 283,081
283,082
74 283,083
283,084
D6— 303 283,085
308 283,086
314 283,087
361 283,088
367 283,089
372 283,090
403 283,091
423 283,092
470 283,093
478 283,094
521 283,095
D7— 27 283,096
43 283,097
76 283,098
392 283,099
D8— 71 283,100
283,101
349 283,102
D9— 345 283,103
418 283,104
433 283,105
D10— 40 283,106
46 283,107
283,108
283,109
62 283,110
D11— 161 283,111
D12— 10 283,112
85 283,113
136 283,114
283,115
147 283,116
157 283,117
283,118
182 283,119
190 283,120
D13— 25 283,121
D14— 5 283,122
6 283,123
12 283,124
39 283,125
53 283,126
283,127
59 283,128
90 283,129
92 283,130
109 283,131
111 283,132
283,133
113 283,134
D15— 23 283,135
D16— 27 283,136
D18— 2 283,137
11 283,138
D19— 2 283,139
49 283,140
88 283,141
D21— 34 283,142
82 283,143
84 283,144
283,145
283,146
149 283,147
154 283,148
157 283,149
177 283,150
194 283,151
D22— 19 283,152
283,153
D23— 40 283,154
61 283,155
158 283,156
D24— 2 283,157
29 283,158
31 283,159
283,160
283,161
283,162
283,163
283,164
64 283,165
D25— 1 283,166
10 283,167
62 283,168
D26— 3 283,169
71 283,170
D34— 21 283,171

CLASSIFICATION OF PLANTS

P.— 46 5,697
68 5,698
5,699
69 5,700
5,701

GEOGRAPHICAL INDEX

OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 : 4,577,825
4,577,965
4,578,533
04 : 4,577,358
4,577,788
4,577,827
4,577,896
4,578,063
4,578,502
4,578,599
4,578,635
4,578,649
05 : 4,577,561
4,577,761
4,577,993
06 : Re.32,098
4,577,356
4,577,357
4,577,391
4,577,392
4,577,398
4,577,411
4,577,417
4,577,418
4,577,435
4,577,447
4,577,461
4,577,474
4,577,487
4,577,499
4,577,503
4,577,520
4,577,522
4,577,542
4,577,585
4,577,625
4,577,629
4,577,639
4,577,669
4,577,682
4,577,705
4,577,726
4,577,730
4,577,758
4,577,760
4,577,779
4,577,790
4,577,792
4,577,796
4,577,797
4,577,798
4,577,812
4,577,816
4,577,817
4,577,824
4,577,864
4,577,879
4,577,894
4,577,901
4,577,924
4,577,926
4,577,927
4,577,929
4,577,950
4,577,955
4,577,957
4,577,958
4,577,975
4,578,014
4,578,019
4,578,032
4,578,059
4,578,075
4,578,079
4,578,083
4,578,086
4,578,126
4,578,137
4,578,168
4,578,175
4,578,214
4,578,225
4,578,227
4,578,252
4,578,265
4,578,283
4,578,321
4,578,324
4,578,328
4,578,350
4,578,356
4,578,375
4,578,515
4,578,527
4,578,530
4,578,536
4,578,537
4,578,566
4,578,572
4,578,576
4,578,593
4,578,594
4,578,609
4,578,620
4,578,625
4,578,631
4,578,636
4,578,637
4,578,652
4,578,663
4,578,675
4,578,678
4,578,681
4,578,683
4,578,709
4,578,721
4,578,750
4,578,762
4,578,768
4,578,773
4,578,777
4,578,791
4,578,793
4,578,803
4,578,805
08 : 4,577,444
4,577,547
4,577,592
4,577,640
4,577,774
4,577,786
4,577,811
4,577,859
4,577,972
4,578,091
4,578,128
4,578,163
4,578,702
4,578,786
09 : 4,577,407
4,577,462
4,577,593
4,577,676
4,577,769
4,577,773
4,577,911
4,577,912
4,577,925
4,578,036
4,578,096
4,578,106
4,578,237
4,578,318
4,578,320
4,578,352
4,578,354
4,578,493
4,578,513
4,578,554
4,578,590
4,578,653
4,578,756
4,578,758
4,578,767
4,578,774
4,578,789
10 : 4,578,108
4,578,286
4,578,598
11 : 4,577,477
12 : 4,577,349
4,577,351
4,577,437
4,577,463
4,577,583
4,577,620
4,577,643
4,577,735
4,577,815
4,577,831
4,577,890
4,577,903
4,577,936
4,577,937
4,577,938
4,577,939
4,577,942
4,578,056
4,578,057
4,578,413
4,578,529
4,578,542
4,578,571
4,578,612
4,578,628
4,578,673
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